JUL 6 1943

PAPER TRADE JOURNAL

JULY 1, 1943

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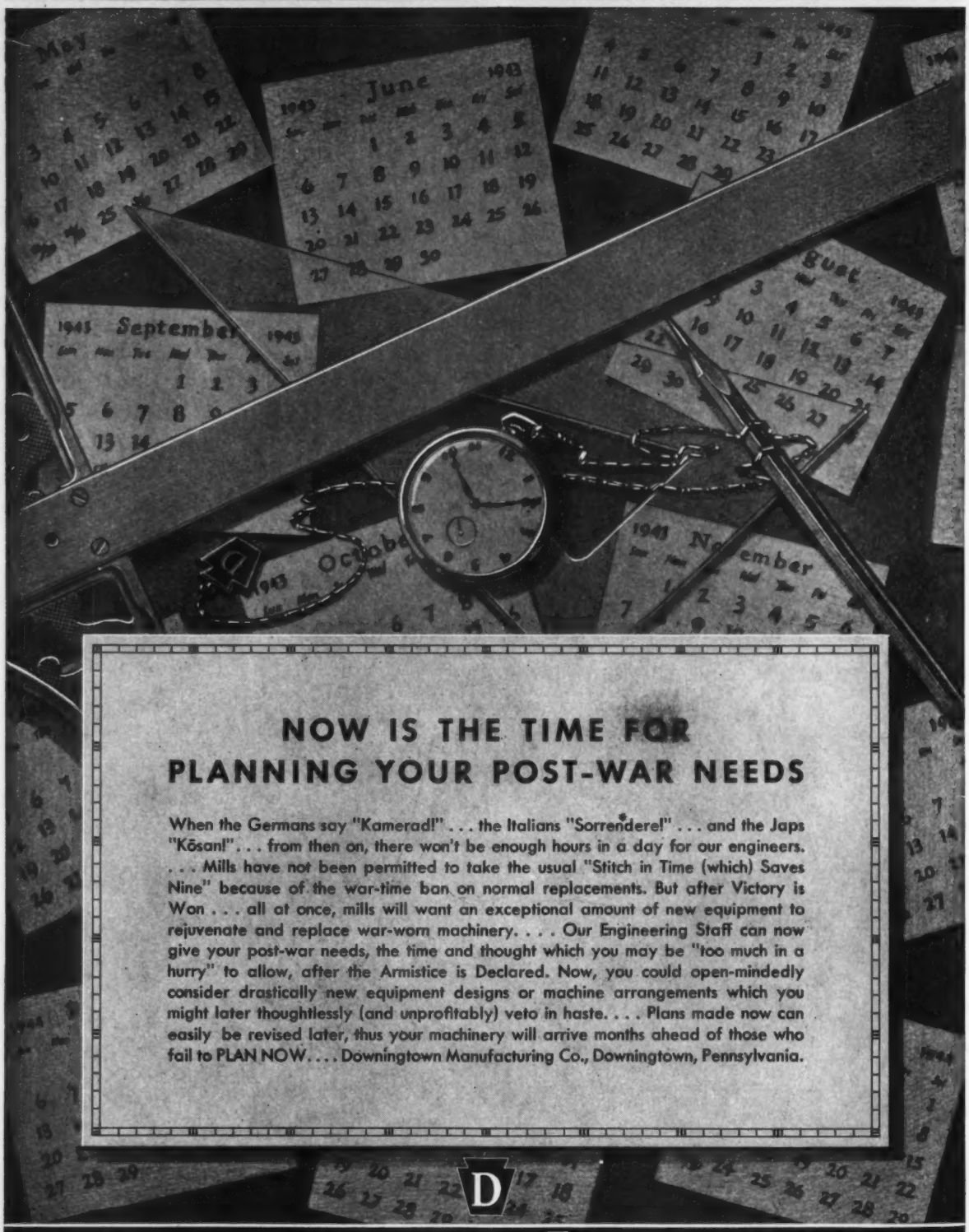

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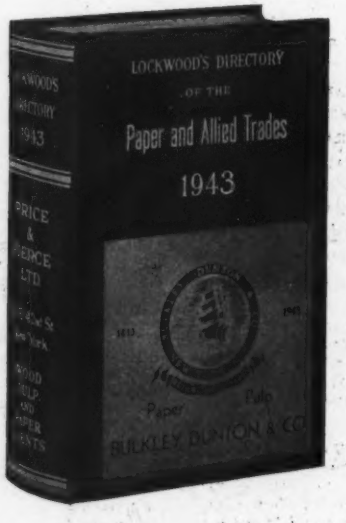

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PAPER TRADE JOURNAL
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Sale of State Timber Lands is Expected

Bill Passed by Wisconsin Legislature Will Permit Commissioners to Make Appraisals and Selective Cutting May Soon Follow—Report Serious Shortage of Loggers—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 28, 1943.—Sale of timber on lands owned by the State of Wisconsin is expected to result from a bill passed by the state legislature appropriating $17,000 to make a survey. It will permit the commissioners of public lands to make appraisals, which has not been done for many years. These forests have been maintained for many years, and it is believed a lot of selective cutting can be permitted to help buyers out of their present situation of scarcity.

Forest Service Permits Cutting

The United States Forest Service, on the other hand, is permitting as much cutting as possible on a selective basis to help supply the demand. Several tracts in upper Michigan have merchantable pulpwood, and bids are being accepted by the Forest Supervisor, Ironwood, Mich. The offers include the following: 700 cords of aspen box bolts and pulpwood near Iron River; a similar item near Basswood and Gibbs City, Mich.; 1900 cords of aspen pulpwood, 30 cords of white birch, 100 cords of balsam and 200 cords of spruce near Elmwood, Mich.; 175 cords of balsam fir, 40 cords of spruce pulpwood and 15,000 feet of spruce sawlogs near Paulding, Mich., and 200 cords of aspen pulpwood and 10 of balsam fir near Elmwood, Mich.

Serious Shortage of Logging Labor

Aside from the problem of supply is the serious shortage of logging labor, according to conferences held recently at Rhinelander and Green Bay, Wis. The Office of Price Administration is trying to get at the root of the difficulties, which appear to stem from the maintenance of ceiling prices on pulpwood on the same basis as for logs going to the sawmills.

The Rhinelander meeting was a two-day affair, with one day devoted to a session of the logging and pulpwood operators, and the other to the loggers' unions. The OPA was serving at each session as a fact finding body, and will reach no conclusions until the reports are reviewed. Although there appeared to be contradictions of opinion in the two meetings, no attempt was made to bring the operators and the unions together to thrash out their problems.

Report Serious Shortage of Loggers

Operators from Wisconsin and upper Michigan reported that there is a shortage of 3,000 to 5,000 loggers in Michigan alone. Unions argued that this is due to the pay scales which caused workers to leave these areas to obtain better paying jobs in war industries. The answer of the operators was that they favored wage increases but could not grant them unless price ceilings on logs were increased. Norman Brown, staff member of the labor and management committee of the War Labor Board, Chicago, said wage increases could be allowed only if they were requested and approved.

It was the opinion of John V. Quinlan, senior log and lumber adviser of the War Production Board, that workers who have gone to the shipyards, the munitions industries and the Alcan highway would not return, and that the wage increase therefore would not solve the loggers' problem. There is no longer a labor reservoir, he argued, and the government is turning to the possibility now of employing German and Italian prisoners of war and Nisei (American-born Japanese).

Major Saxon Holt, Jr., member of the labor and management committee of the state selective service system, said the withdrawal of men in draft age from industry will continue and that married men will not be called until August. "The labor supply problem will be a big one in all areas because we eventually will have an army of about 11 million men,' 'he said.

The session was in charge of Norman Schulze, special representative of the War Manpower Commission in charge of the La Cross-Eau Claire-Wausau-Rhinelander area. During the labor discussion, unions contended they had offered to set up production committees to increase the amount of timber cut but the operators refused to cooperate. Representatives of the International Brotherhood of Pulp, Sul-

(Continued on page 10)

Newsprint Price Situation Unsatisfactory

Upward Adjustment to Cover Higher Costs Under Government Restrictions or Subsidies Are Considered Necessary — Ontario Paper Co. Open Alcohol Production Unit—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 28, 1943.—What results will flow from this week's conferences at Montreal between representatives of United States office of price administration and the Canadian wartime prices and trade board, could not be immediately ascertained. The proposition that American newspaper publishers cut their consumption of newsprint another 10% and at the same time pay Canadian manufacturers of newsprint a higher price than they have been receiving, brings the inevitable suggestion of a "squeeze."

Newsprint manufacturers here, however, deny any such inferences. They state that the timing of the price increase negotiations is under control of the OPA. The subject has been on the docket for the last eight months and the OPA alone has let it come to a head at this time. It is stated that price is inescapably linked up with production and supply.

The ambition of every Canadian mill is to get volume; the ideal is capacity operations. That is when they have their costs down to a minimum and where their profits are largest. It must be recognized, they say, that when production and supply drop off, there is an automatic increase in price. With both production and supply controlled by government agencies, it follows that price is also a matter of jurisdiction for the same authorities. The price must now be adjusted, it is claimed, to allow for the increased costs arising from present governmental policies. Unless an upward adjustment is made in the price of newsprint, it is added, then the time is not far off when the mills will have to be subsidized.

Situation Similiar in Both Countries

Some operators point out that the production and price situation in the U. S. is not much different from that in the United Kingdom. Old Country newsprint mills are now producing at about 19% of their prewar rate, which was at or very close to capacity, before the war started. The drop in production has resulted in a sharp upswing in costs. To compensate the mills, the price of newsprint paper in England was raised from ten pounds to thirty-two pounds, five shillings, per ton. In addition the mills receive the best part of two pounds additional to allow for the differential in producing a lighter-weight paper. Thus over a period of nearly four years these mills have had the price of their product increased on official government orders by 230%. Here in Canada, newsprint manufacturers are experiencing much the same thing, though to a much lesser extent, and the only adjustment in price so far has been the $4 a ton boost granted last March.

Explains Newsprint Situation

Canadian newsprint manufacturers also point out that publishers are paying less for their total supply of paper in relation to overall costs. The tonnage of paper used has declined to a greater extent than the price has increased. Attention is also drawn to the fact that at the end of the first quarter, U. S. publishers were to have had another 10% paper cut, but that was withdrawn at about the time of the March increase in price. Recently the OPA has brought pressure to get American publishers to reduce their consumption 10%, under 1941 base levels, and it has been freely predicted that additional restrictions must be applied on consumption or some form of allocation adopted to ensure equitable distribution of available supplies. U. S. publishers apparently did not relish the possibility of allocation regulations and suggested a further 5% cut in consumption. Less consumption means less production, thus still higher operating costs are inevitable, it is claimed, and no one believes Canadian newsprint manufacturers can continue satisfactory operations with constantly accelerating costs and frozen prices.

Thorold Mill Opens Alcohol Unit

The new plant of the Ontario Paper Company at Thorold, now producing alcohol on a large scale from the sugar in sulphite liquor, which is ordinarily wasted, was inspected last week by Canadian and United States officials, among them U. S. Rubber Director William Jeffers, who expressed the opinion that similar plants would be established by other mills.

The half-million-dollar plant at Thorold will produce exclusively for purposes designated by the Canadian controller of chemicals, for the duration. The alcohol goes into the manufacture of synthetic rubber, explosives, solvents and is used as a raw material for making other war-useful products. "At the same time the plant serves as a demonstration which will show the possibilities of this method of utilizing sulphite waste," a statement from the company says. Extensive research work on pulp mill waste has been in progress at the Forest Products Laboratories at Ottawa and a laboratory at McGill University maintained by the Newsprint Association of Canada. "There isn't much you can't make out of sulphite liquor, one chemist claims. "We have shown that in our laboratories," he said. At Thorold the waste liquor, which is acid, is aerated to remove sulphur dioxide and neutralized with lime. It is then pumped into fermenters, yeast being added. The fermented liquid, containing approximately 1% alcohol, is distilled, the end product being 190-proof alcohol.

Prominent Men at Thorold Ceremony

Among others who attended the ceremony at Thorold were: Senator Burton K. Wheeler of Montana; Senator Raymond E. Willis of Indiana; Senator George D. Aiken of Vermont; Senator Norman Paterson of Fort William; Senator J. Joseph Bench of St. Catherines; Harry J. Carmichael, co-ordinator of production and chairman of the production board of the department of munitions and supply, Ottawa; Dr. E. T. Sterne, controller of chemicals, Ottawa; R. C. Berkinshaw, president of Polymer Corporation, Ltd., Toronto; Col. Robt. McCormick, publisher of the Chicago Tribune. The United States senators were all members of the U. S. agricultural subcommittee.

Paper Backlog Orders Increase in Midwest

Heavy Demand Reported in All Types of Paper with Kraft Papers Strong and Bond Papers Tight—WPB Sponsors Waste Paper Salvage—Paper Employment in Illinois Declines—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 28, 1943.—There is an increasing belief in this area that pulp will average around 25% less this year than last year and that whether or not the industry will suffer most critically is going to depend a great deal on the shortages of essential ingredients in paper making, including starch which is now proving more valuable in its original state as starch as farm feed.

Chicago paper trade offices report continued strong demand with the heavy demand for quality merchandise the country over increasing buyer wants all along the line. As a result, order backlogs are going beyond any satisfactory basis and a renewed selectivity and allocation program is featuring every local procedure. Manpower conditions continue acute but there is real interest in Canada's program to get farmers to cut pulpwood in their spare time. Just what "spare time" is to a farmer these days has not as yet been fully defined here.

Book and cover papers are headed for some reduction in quality because of the casein situation and the manpower situation in mills is making the situation more acute. Krafts are strong while groundwoods were evidencing an increased backlog of orders from day to day. Bonds were in a tight selective market while specialties were likewise crowded into the confusing picture along with the entire range of paper products.

Salesmen Open Golf Season

The western division of the Salesmens Association of the Paper Industry opened the association golf season on June 18 at the Park Ridge Country Club with a very successful outing. According to word from Herman Berge, Appleton Coated Paper Company, and chairman of the golf committee, attendance was good at both the golf program and the enjoyable dinner event in the evening. Prize winners were headed by Gene Hommes of the Graham Paper Company, who won low gross honors. High gross went to F. Kettle of the Allied Paper Mills. Other winners are as follows:

First low net, S. Heberling, Dwight Bros. Paper Company; second low net, R. C. Johnson, Fletcher Paper Company; third low net, C. H. Carlson, Associated Stationery Supply Company; fourth low net, I. Staller, Randolph Bag and Paper Company; fifth low net, G. Olson, Nackie Paper Company; sixth low net, Burt Fisher, Bergstrom Paper Company; seventh low net, T. Gorman, Union Bag and Paper Corporation, and eighth low net, W. Hafner, Whitaker Paper Company.

First nine low net honors went to Gene Todd of Bermingham & Prosser while second nine prizes were copped by C. Egan of the Hennepin Paper Company. Low putts prizes were won by Hank Fulton of the Bunden Lyon Company and Ray George of Tomahawk Kraft Paper Company. G. Mueller, C. H. Carlson, W. L. Snelling and E. W. Beimfohr made up the high gross foursome while low net foursome honors went to T. Oliver, G. Hennes, W. Grant and F. Kettle. Low putt foursome honors were won by L. J. Walker, L. Ransom, W. Schulman and I. Staller. Blind bogey winners were Charles Egan, L. Ransom and Walter Schulman.

Advertise for Waste Paper

War Production Board sponsored advertisements, paid for by industry, are now appearing in Chicago newspapers in an effort to speed up collections of waste paper. The advertisements read in part as follows: "A serious waste paper shortage exists. . . . WPB officials are urging the public to help relieve the shortage by saving all forms of brown waste paper for conversion into necessary military equipment. . . . Sell to a dealer or give your accumulation to charitable or other organizations." It is indicated that the waste paper will be used to help make blasting kegs, airplane parts and "other war weapons."

Labor Markets Continue Decline

Declines in employment and payroll in the paper and allied industries in Illinois continue to be evident. Last Department of Labor figures for March show a 3.6% decline in employment and a 4.7% decline in payrolls for the 274 reporting firms as compared to a 1% increase in employment and a 1.6% increase in payrolls for all reporting industries.

On WPB Advisory Board

Two Chicagoans, Walter J. Hamlin of the Universal Paper Products Company and Leo J. Hulseman of the Paper Container Manufacturing Company, have been appointed as members of the Paper Cup Industry Advisory Committee under E. R. Van Meter who will serve as the government representative and presiding officer.

Waste Material Dealers Meet Here

The western division of the National Association of Waste Material Dealers has been meeting in the Hotel Sherman, Chicago, during the present week discussing problems confronting the salvage industry and stressing the importance of maintaining high salvage levels. Chief speakers at the banquet sessions were Ben Reagan and Ben Friedman, both representing the salvage division of the War Production Board. Major topic of discussion continued to be the critical manpower shortage and to the danger of actually retarding production by employing too inexperienced and unqualified men.

To Join N. E. Paper Merchants Assn.

BOSTON, Mass., June 28, 1943.—Applications for membership of the following firms in the New England Paper Merchants Association have been approved by the Board of Directors:

Sugarman Brothers, Cambridge, Mass.; Waltham Paper Products Company, Wentworth Paper and Chemical Division, Waltham, Mass., with a branch office in Boston, Mass.; H. Berger Paper Company, Lawrence, Mass., and Chester G. Parsons, Brighton, Mass.

SALE OF STATE TIMBER LANDS IS EXPECTED

(Continued from page 7)

phite and Paper Mills Workers and the Brotherhood of Papermakers took part in the discussions.

Twenty-five large pulpwood producers from northern Wisconsin and upper Michigan attended the meeting at the Beaumont hotel, Green Bay, Wis., at which W. K. Kidder of Chicago, Region VI pulpwood specialist, presided. It was one of a series through which OPA expects to provide sufficient data on operating and manpower conditions of the pulpwood industry to allow the government agency to revise regulations referring specifically to logs and bolts used in the manufacture of paper. The operators contend discrepancies now existing between regulations covering pulpwood and wood used for other purposes should be eliminated. Mr. Kidder indicated the regulations probably would be changed, but they cannot be expected soon, inasmuch as the data have not been entirely collected. These would cover producers in the Lake States forestry area.

Paper Co. Must Pay Dividend Taxes

The Minnesota Mining and Manufacturing Company, which has a branch plant at Wausau, Wis., for the manufacture of abrasive papers, must pay the assessment of dividend taxes made by the State of Wisconsin. The company was one of several which brought suits declaring the Wisconsin tax on the privilege of declaring corporate dividends was constitutional, and that it applied to foreign corporations doing business in the state.

Protests had been filed after litigation in which the dividend tax law was upheld by the Supreme Court of the United States. The Wisconsin Supreme Court, however, affirmed its previous ruling. It stated that the tax was an excise or privilege tax and not a levy upon income; that it applied to stockholders and not to corporations; that companies operating within and without Wisconsin had not substantiated their claims ihat no dividends were paid out of money earned in the state.

Fox River Co. Grants Wage Increase

The Fox River Paper Corporation, Appleton, Wis., has granted a wage increase to male workers of four cents per hour and to women of two cents per hour. The increase is retroactive to October 3, 1942. Approval of the War Labor Board was sought and it was recently granted.

This company's predecessor, the Fox River Paper Company, lost out in the decision of an arbitration board considering a wage dispute in 1938 between the company and the International Brotherhood of Papermakers, Local 16. The board ruled in favor of the workers, according to an order filed in the circuit court of Judge Henry P. Hughes.

The board found that the company on September 11, 1938, cut the basic wage rates five cents per hour for men and three cents per hour for women. The order listed the amounts due various employees, plus interest. The period of time involved was the two months from the time the wages were cut until the company was sold to the present owners.

The Badger Paper Mills, Inc., Peshtigo, Wis., has been cited by the Wisconsin Motor Vehicle Department for being the leader of general industrial fleets travelling less than 25,000 miles. The trucks were classified according to the type of business, miles driven and accidents incurred.

Water Near Flood Level at Marinette

Because of torrential rains, the Marinette Paper Company, Marinette, Wis., was obliged to open seven gates of its dam last week to prevent floods. The Menominee River reached six times its normal flow.

Arthur Landenberger of this company has been placed in charge of a mill war bond drive to step up the sale of war bonds on a payroll deduction basis.

Ronald Evans Made Lieut.-Colonel

Ronald Evans, former senior engineer for the Kimberly-Clark Corporation, Neenah, Wis., who is serving in the U. S. Army, has been promoted to lieutenant-colonel. He is now in charge of martial law in a town in Tunisia. He was a captain at the time he went overseas, and was made a major during the Faid Pass campaign. He has been awarded the Purple Heart after being wounded.

Harrison-Harris Nuptials Soon

James J. Harrison, who received his master of science and doctor of philosophy degrees at the Institute of Paper Chemistry, Appleton, Wis., will be married in July to Miss Letitia Harris, Wauwatosa, Wis. Mr. Harrison is from Conrad, Mont., and has accepted a position as a chemist at Rittman, Ohio.

War Uses of Heavy Duty Container

A new issue of the General Box is now being distributed by the General Box Company of Chicago. Packed with interesting photographs, this issue tells the story of general heavy duty boxes, a new type of wirebound container that has come into widespread use since the beginning of the war.

Designed to combat the hazards of overseas transit, the heavy duty box represents the furthest advancement in export shipping containers. As the booklet points out, these boxes are not constructed of veneer as are the majority of wirebounds used in domestic shipping. They are made from ⅜-inch resawn hardwood lumber, specially selected for strength to meet rigid specifications. In addition to this natural strength, the box is wire-stitched, providing a package of unusual stamina—well able to withstand the rough treatment that rush war requirements make necessary.

Within its sixteen pages of highly informative material, this issue of General Box covers the shipment of a few of the vital war products which travel to the fighting fronts in General Heavy Dnty Boxes.

For instance, parts for tanks go by land, water and air in general wirebound boxes, arriving in perfect condition—ready to start trouble for the Axis.

Shippers of war products will find this issue of the General Box filled with items of interest—with plenty of shipping hints of how to pack vital products and to be sure they arrive in perfect condition. A copy of this interesting war packing issue of the General Box can be obtained from the General Box Company of Chicago.

Obituary

William E. Sykes

William E. Sykes, famous authority on gears and inventor of the Sykes continuous tooth herringbone gear and the Sykes gear generating machine, died in England on June 19. Mr. Sykes was formerly associated with Farrel-Birmingham Company at its Buffalo plant, but for the past six years has been in England operating his own plants, W. E. Sykes, Ltd.

Mr. Sykes was born and trained in England, receiving his technical educations at Leeds University. The five years after graduation from Leeds were devoted to the acquiring of knowledge of practical engineering and manufacture in one of the world's largest gear plants.

In 1908 he was appointed factory manager of another large gear plant in England and subsequently was promoted to chief engineer and general manager.

In 1923 he joined Farrel-Birmingham Company, who acquired the American rights to the Sykes process of gear generation. At the company's Buffalo plant his entire efforts were devoted to the development of the Sykes gear machine and promoting the use of the machine and the Sykes continuous tooth herringbone gear.

As an inventor Mr. Sykes was notably successful. Over one hundred patents were issued to him. His discoveries in kinematics aroused considerable interest in the scientific world. His original one-tooth pinion model has received world-wide attention.

In 1934 Mr. Sykes was awarded the Edward Longstreth Medal by the Franklin Institute of the State of Pennsylvania, in recognition of the development of the Sykes gear generator, the concurrent development of the Sykes process of gear generation and the Sykes continuous tooth herringbone gear, and for other work of scientific value in the field of gear design, manufacture and application.

Some years ago, while still in this country, Mr. Sykes organized a company in England to manufacture Sykes gear cutting equipment. This business rapidly grew into a successful enterprise and in 1937 Mr. Sykes returned to England to devote his entire time to operating it, but at the same time retaining a connection with Farrel-Birmingham Company as consulting engineer.

Alfred F. Harris

CLEVELAND, Ohio, June 28, 1943—Alfred F. Harris, a national figure in the graphic arts industry and a pioneer in developing the offset lithographic press, died in his residence at the Alcazar Hotel here yesterday at the age of 83. He was chairman of the board of the Harris-Seybold-Potter Company.

He was born in Covington, Ky., a son of James and Hannah Carpenter Harris, who had come to this country from Birmingham, England. His father was an early steel manufacturer.

One of a family of eight children, he learned the trade of a watchmaker in his youth, and later with one of his brothers operated a jewelry store in New Philadelphia and then in Niles, Ohio.

While working as a jeweler he turned a joke into an idea that took him and his brother into the press manufacturing field.

His younger brother, the late Charles G. Harris, visited a printing shop and saw presses being fed by hand. To play a trick on the owner of a new press, the brothers built an automatic feeder model. This was laughed at when completed, but today the basic principle on which it was patented remains unchanged.

Mr. Harris was one of six men in the graphic arts industry to win the "Modern Pioneer," award of the National Association of Manufacturers for the development of the offset lithographic press. He established his first company for the manufacture and improvement of presses in 1895 at Niles, with headquarters in the first home of President William McKinley.

The plant was moved to this city in 1917, and since then the company established another plant at Dayton for the manufacture of bindery equipment.

Mr. Harris was a Thirty-second Degree Mason, a Knight Templar and a member of the Union Club.

His son, Alfred S. Harris, vice president of the Harris-Seybold-Potter Company, survives.

Granville Gray Valentine

At a meeting of the directors of Standard Paper Manufacturing Company, Richmond, Va., held on June 10, 1943, the following resolution was unanimously adopted and recorded: We, the board of directors of Standard Paper Manufacturing Company, feel keenly the loss of a valued friend and much beloved associate in GRANVILLE GRAY VALENTINE, who passed away on June 2, 1943.

Mr. Valentine was one of the founders of Standard Paper Manufacturing Company, and was a director of the Corporation from 1901 to 1937, a period of 37 years. In all of this period he unstintingly gave to the company his moral and financial support, and his sound judgment and wise guidance will be sorely missed.

Aside from his connection as a much loved and respected business associate, his position in the cultural, educational and civic life of the city of Richmond gave him a distinction which has been rarely equalled by any citizen of this community.

We extend to his family our deepest sympathy in this great sorrow, and further be is resolved, that this testimony be spread upon our minutes, and a copy be transmitted to his family.

James R. Thornton

S. P. Richards Paper Company, Atlanta, Ga. announce with sorrow the death on June 10 of James R. Thornton, sales representative in the Southeastern area for fifty years continuously for this company. Mr. Thornton was known intimately as "Uncle Jimmy" by practically every publisher in the area which he worked, and was held in high esteem by all. Many names on the company books today were placed there by Mr. Thornton forty and fifty years ago. Until the last few years this splendid salesman was an indefatigable worker, but due to his advanced age he had been compelled to limit his calls. Mr. Thornton's death was occasioned from injuries sustained in a fall when crossing a wet street in Athens, Ga. on June 7. Shortly before he passed away he regained consciousness for a few minutes and spoke to those around him regarding the disposition of an order for one of his customers. He loved his customers and his work, and was loyal to both until the end. He truly "died with his boots on."

Instrumentation Studies XLV*

Penetration of Papers by Water Vapor Part. II.

An Electric Sword Hygrometer for Measuring the Relative Humidity of Air Inside Packages or other Enclosures

By The Staff of the Institute of Paper Chemistry

(Concluded from the issue of June 17, 1943)

Performance Tests with Packages

Commercially packaged fine-grained cereals, powdered milk, and the like were experimented with to obtain information on *(a)* details requiring improvement, *(b)* possibility of using a small circulating system, *(c)* effect of leaks, and *(d)* time required for approximate equilibration of the hygrometer with the contents of a package.

In this work, packages were conditioned for various times in either a hot-and-dry room at 100° F. and 23% R.H. or a hot-and-humid room at 100° F. and 90% R.H. In some cases the contents of the packages were poured from one carton into another to hasten the change in moisture content. Before removal from either hot room, a box was wrapped in a good moistureproof paper and the seals carefully made to ensure that the food would remain at essentially constant moisture content during the subsequent tests. Since a moisture content corresponding to complete equilibrium in the hot-and-humid room would be far above the range of any of the hygroscopic elements, exposure in this room was made only when it was necessary to elevate the moisture content of the food.

In the laboratory, which was not maintained at any particular temperature and relative humidity, a package under test was pierced by the sword hygrometer and the current was noted. Holding the package and the hygrometer in the hands, the package was rotated back and forth so that its contents fell around the hygrometer. The typical time required for the indicated relative humidity to approach to within 1% of the final limiting value was between about 1.5 and 3 minutes.

No changes in calibration larger than would be expected on the basis of aging of an element could be attributed to contact with dry foods. No element was placed in contact with damp or wet food, for it was believed that prolonged contact with any wet material would almost certainly result in a change in calibration, if not in physical damage. However, no change in calibration was caused by an exposure of many hours to air at 100° F. and 90% R.H.

The work with foods suggested two types of guards: one, a cylindrical arrangement comprising several rods parallel to the axis of the sword, with the spacing between the rods large enough to permit the brushing of the element with a camel's-hair brush; the other, a similar guard covered with a coarse screen. The former type may be used where the food particles are not larger than about ⅛ inch, or where the material is flimsy or soft. Where the pieces of food are sufficiently large and hard to damage the alundum coating (which may flake off by failure of the PVA bond between the alundum particles), the screened guard should be used. Where this latter guard is employed it might prove necessary, depending upon the nature of the material tested, to remove the guard to clean the element.

It was hoped that packages could be tested by withdrawing air through a small tube, passing this air over the hygrometric element, and returning the air to the package. A positive-action, leakproof pump of very small volume was designed and constructed for this work. The guard for the element was replaced by a thin-walled metal pipe having inlet and outlet tubes at its ends. This jacket made an almost airtight connection with the hilt and head of the sword; the seal was perfected by the application of a small amount of petrolatum. In most cases the readings obtained with this arrangement agreed very well with those observed by the normal procedure of piercing the package. In spite of great care in the use of the circulating system, however, large discrepancies were sometimes observed. These appeared to be the result of slight traces of moisture in the tubing or a small leak where the suction line lanced the package. In view of the greater probability of serious error in routine use and also in view of the inherent awkwardness and indirectness of a circulating system, work on this method was abandoned.

The laboratory tests of packaged foods with the sword hygrometer were not subject to error due to lack of a perfect seal between the hilt and the wall of the package. Any air which leaks into the package by mass motion through the space between the hilt and the package wall must replace air passing out of the package at some other point. Because the package of interest are, or should be, airtight, there can be no flow of air through the space at the hilt, unless the operator pumps air in and out of the package by periodically squeezing the side walls, an action that obviously should be avoided even when one takes the pains to perfect the seal with wax. Moisture can enter or leave the package at the perforation by diffusion, but the amount of moisture which can enter by this process during the few minutes required for the test would have a negligible influence on the observed relative humidity. The mass of water entering by diffusion would be of the order of miligrams, whereas the mass of water in a pound or two of dry food is of the order of 50 grams. Hence, it is thought that sealing with wax is not necessary where the perforation is neat and the ruptured surface bears snugly against the hilt. If for some reason a gaping hole is formed, it would be necessary to patch the hole around the body of the sword.

* This report is one of a series issued as a part of the instrumentation program of the American Paper and Pulp Association. Part I of this particular series appeared in Paper Trade Journal 116, no. 14:11-15; no. 23:10-13 (April 8, June 10, 1943). The first installment of Part II appeared in Paper Trade Journal 116, no. 24:16-19 (June 17, 1943).

A Portable Instrument

There is a need for a small, preferably light instrument which can be used in the field. One immediately thinks of B-batteries as a possible source of e.m.f. in a portable device. However, both theory and actual trial in the laboratory demonstrated that operation of the hygrometric elements with a unidirectional current is not feasible. It is probable that satisfactory operation could be obtained with B-batteries connected to the element through a rapidly revolving commutator, which would convert the direct current to a square-wave alternating current. The use of a vibrator of the type employed in automobile radios to generate alternating current seemed more attractive, however, and work was directed along this line. It was hoped that satisfactory operation could be effected with a few 1.5-volt dry cells in series connection, of e.m.f. less than the customary 6 volts of a lead storage battery. A 10,000-ohm potentiometer rheostate was connected across the output of the vibrator transformer, and the d.c. input voltage was varied from 6 volts down while the output wave form was studied by means of an oscilloscope. A good, symmetrical, almost square-wave form was observed in the neighborhood of 3 volts, and this held until the voltage was as low as about 2.5 volts. Because two 1.5-volt dry cells are not excessively heavy, it seemed practicable to design a portable unit incorporating a vibrator generator.

The circuit diagram of the portable instrument is given in Fig. 5. It will be noted that a single microammeter and instrument rectifier is employed for alternatively measuring the voltage impressed by the potentiometer rheostat and the current flowing in the hygrometer element.

A photograph of the finished instrument is shown in Fig. 6. Not appearing in this photograph are two charts which are cemented conveniently to the inner surface of the lid. One of these, reproduced in Fig. 7, gives a family of uniformly spaced curves, which are used as described in the following section. The other (Fig. 8) indicates the equilibrium relative humidity of air in contact with a saturated solution of potassium acetate. A bottle containing a saturated solution of this salt is included in the instrument for calibration purposes. With a rubber stopper at the hilt, the element is sealed in the bottle and sufficient time is permitted to elapse to obtain a constant reading of the microammeter. This time will vary with the element and the desired accuracy, and is of the order of 30 minutes. The temperature is observed so that a correction to subsequent reading may be made. Details regarding the calibration are included in the following section.

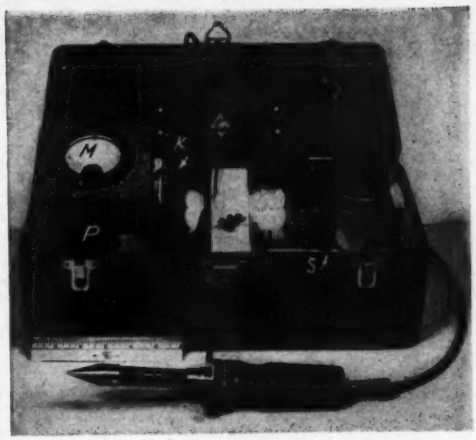


FIG. 6
Portable Hygrometer

In designing the portable instrument, provision was made for operation in a very humid atmosphere. In those portions of the circuit where high insulation resistance is required, wires, resistors, and other small components are mechanically supported by polystyrene insulators. To test the dependence of instrumental response on the humidity of the atmosphere (apart from the conductivity of the hygrometric element which, in a normal test, would be inside a dry package), the sword hygrometer was replaced by resistors totalling 2.2 megohms. In a dry room, where the relative humidity was 23%, the current reading was 14 microamperes. After 15 minutes in the hot-and-humid room, the reading was not detectably different from the dry-room figure of 14 microamperes and, hence, it was concluded that the instrumental response is free of significant error due to the failure of insulation resistance at high humidity.

Procedure for Using and Calibrating the Portable Instrument

In the interests of expediency, instructions which might later be desired for the actual use of the electric hygrometer are included in this report. These instructions follow:

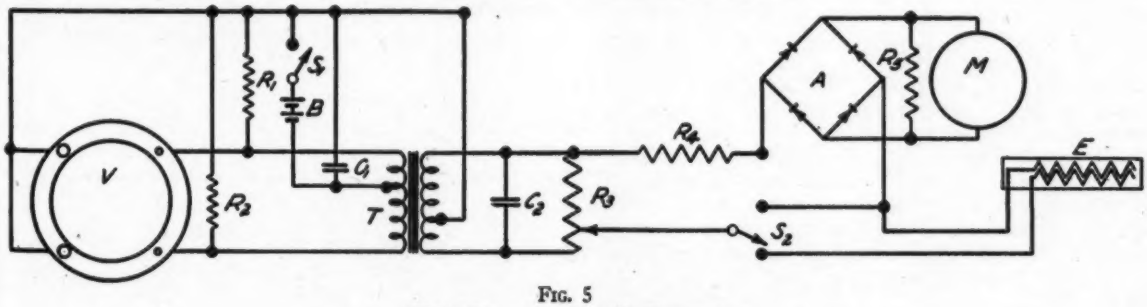


FIG. 5
Wiring Diagram for Portable Hygrometer

R_1—100-ohm resistor
R_2—100-ohm resistor
R_3—10,000-ohm potentiometer
R_4—1.0-megohm resistor
R_5—1000-ohm resistor
A —Instrument rectifier
T —Power transformer
C_1—0.5-mfd. 400-volt condenser
C_2—0.005-mfd. 1600-volt condenser
S_1—Toggle switch
S_2—Single-pole double-throw switch
V —Vibrator
M—0-50 microammeter
B —Two 1.5-volt "A" batteries
E—Electrical hygrometer unit

1. Turn the potentiometer knob (*P*) (*see* Fig. 6) to zero. This is an important precaution to observe before turning on the "A" supply (step 2) to avoid damage to the microammeter (*M*), should the potentiometer accidentally be left in a position causing the microammeter to deflect strongly off-scale.

2. Turn on the 3-volt "A" supply to the vibrator by means of the toggle switch (*S*). (For long battery life, it is advised that this switch be on only while a reading of relative humidity is being made.)

3. Throw the knife switch (*K*) toward the front of the instrument and adjust the voltage supply with the potentiometer (*P*) to obtain the reading of the meter corresponding to a supply of a potential of 100 volts.

4. With the exception of the calibration of the hygrometer element, which will be described later, the instrument is now adjusted for relative humidity determinations. Select the hygrometer element it is estimated will cover the relative humidity range of interest and put it in the sword. Depending upon the type of food or material to be tested, also select the cylindrical shield to be used and complete the assembly of the sword. Insert the sword in a package, throw the knife switch (*K*) toward the rear of the instrument, and observe the meter reading. A frequent check on constancy of voltage should be made (*see* step 3). Allow sufficient time for the hygrometer element to equilibrate with the conditions in the package. During the equilibration time, it is advisable to tip the package gently from side to side or to turn it end over end so as to disturb the material in intimate contact with the element and thereby expedite the determination.

5. Obtain the relative humidity corresponding to the meter reading obtained in step 4 from the calibration curves (Fig. 7) for the specific hygrometer element used in the test. As the instrument reading is somewhat dependent upon temperature, a temperature correction should be applied to the value obtained from the curves, if the test was performed at a temperature other than that at which standardization was made. Subtract 0.21% R.H. from the curve value for each degree Centigrade above standardization temperature, and conversely add 0.21% R.H. for each degree below that temperature. (On the Fahrenheit scale, the correction is 0.12% R.H. per degree.)

6. Clean the hygrometer element with a soft brush immediately after each test. This is particularly important after the element has been exposed to powdered hygroscopic materials.

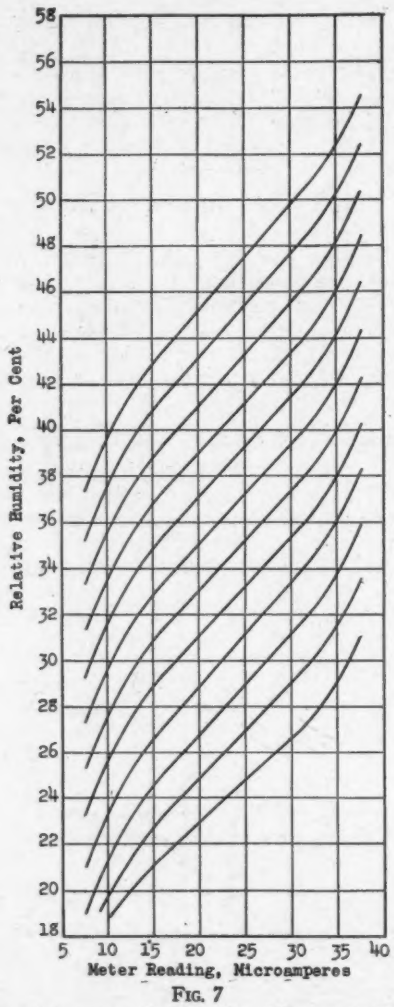


FIG. 7

Family of Curves for the Calibration of Hygrometer Elements

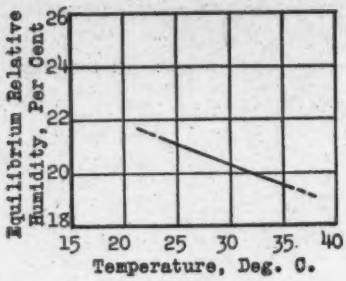


FIG. 8

Relative Humidity of Air in Contact with Aqueous Saturated Potassium Acetate

To conserve the battery, in actual use it would be well to turn on the main switch *(S)* only after the hygrometer has been in the package sufficiently long for equilibrium to be established. Then, following the short period required to standardize the voltage and read the meter, the main switch should be turned off.

The calibration of the elements may be checked, whenever it is deemed advisable, with the saturated solution of potassium acetate provided with the unit. At a temperature of approximately 23° C. or 73° F., this saturated solution should be in a slushy condition. Very little, if any, liquid should exist above the solid phase of the solution. Any deviation of the solution from this condition may be corrected by adding either potassium acetate or distilled water. In view of the fact that the relative humidity above the saturated solution is dependent upon the temperature, it is necessary to measure the ambient temperature of the solution and then ascertain the relative humidity for that temperature from the curve of Fig. 8. Carefully remove the sword tip and cylindrical shield from the sword assembly, place a small cork in the open end of the element, and slip the rubber stopper onto the hilt so that, when the element is placed in the bottle, a good seal is accomplished. Exercise extreme care when placing the element in the bottle so as to avoid contamination of the element with the potassium acetate. Obtain the meter reading and relative humidity over the saturated solution as in step 4 above, allowing plenty of time for equilibrium. To reach equilibrium and be within 1% of the correct R. H. requires from 15 to 30 minutes. Using the reading thus obtained and Fig. 8, locate a corresponding point on the family of curves presented in Fig. 7. Select the curve nearest this point as representative of the calibration for a given hygrometer unit and use this curve for subsequent humidity determinations. For some determinations, depending upon the accuracy required, interpolation of values falling between curves will be necessary.

As the design of the sword is such that the parts must be assembled or disassembled in proper order, the following procedure is recommended. Remove the sword tip, so that the cylindrical shield may be removed. In removing and handling the element, touch the bound ends only. Care must be exercised in removing or installing a cylindrical shield to see that the shield does not damage the element by harsh contact. At first, some difficulty may be encountered in removing the tip, in that the connection between the element and the handle might loosen before the connection between the sword tip and the element. Cir-

cumvent this difficulty by applying a small side pressure to the tip of the sword while unscrewing the tip.

Addendum on a Nonportable Instrument

The wiring diagram for the laboratory arrangement of the sword hygrometer, shown in Fig. 1, indicates two electric meters. In view of the present scarcity of electric meters, it is suggested that a single meter be made to suffice for measuring both the current through the hygrometer element and the voltage across the variable resistance R of Fig. 1. This may be most simply accomplished by modifying that part of the diagram of Fig. 1 to the right of the potentiometer resistance R to be like that of the wiring diagram of Fig. 5 to the right of the potentiometer resistance R_3. Manipulation of the switch S_2 enables the operator to go rapidly from checking of voltage to observation of the current through the hygrometer.

The shunt of 1000 ohms used with the meter in both Fig. 1 and 5 served only to permit measurement of currents greater than the normal range of the microammeter. If a less sensitive meter is at hand, or purchasable where a more sensitive microammeter is not, a shunt should not be used. In this case the series resistance ("1 megohm" in Fig. 1, or R_4 in Fig. 5—also 1 megohm) should be made smaller, the choice being such that essentially full-scale deflection of the meter will be obtained when the switch S_2 is thrown to measurement of voltage. For example, if the range of the meter is 0-0.5 milliampere, the series resistance should be of the order of 200,000 ohms. The use of a less sensitive meter will require, for the same humidity range, a greater concentration of lithium chloride. The most suitable increment in concentration should be obtained by trial.

The voltage applied to the series combination of hygrometer element and high resistance (R_4) need not be 100 volts, or any other specific value. It should be preferably of the order of 100 volts, but be maintained constant, so that calibration charts may be accurately employed. The rheostat R of Fig. 1 should have a power rating of not less than $15{,}000/R$ watts.

Literature Cited

1. Dunmore, Francis W. Improved electric hygrometer. J. Research Natl. Bur. Standards 23, no. 6:701-714(Dec., 1939).
2. Van den Akker, J. A., Root, Carleton, and Wink, Willmer A. "Multiple-specimen Neenah expansimeter." Paper Trade J. 115, no. 24:33-36(Dec. 10, 1942).

Controlling Factory Production

Carefully planned production control in plants — small, medium, or large—has enabled manufacturers of wartime goods to double their output without undergoing serious disruptions despite machine and manpower limitations. The means used to help accomplish such intensive controlled production, avoiding idle equipment and inefficient scheduling, are made the subject of a report recently issued by the Policyholders Service Bureau, Metropolitan Life Insurance Company, entitled "Controlling Factory Production."

This report is concerned with the time element in manufacturing and in related functions, viz., the question of when given quantities of goods are to be produced. This includes the problems of meeting promised delivery dates, maintaining a steady flow of work in the shop, properly utilizing the available equipment and manpower, and avoiding congestion in the plant. All these objectives require strict adherence to standardized procedures which operate, to a large extent, through the medium of time-control forms and supplementary records. A variety of these forms and records, as well as suggestions as to their practicability and use, are discussed in "Controlling Factory Production."

Much emphasis is placed on scheduling and progress control as fundamental considerations in production control. The report describes the scheduling of work both in jobbing shops and in factories having continuous-flow production, and cites methods by which the former type of company often capitalizes on the easier planning problem of the latter. Separate descriptions are given of the scheduling in small, medium-sized, and large shops. Machine-load control, which is designed to minimize bottlenecks, is described and illustrated, and typical expediting procedures are outlined.

Effective production control, the report states, depends on the existence of a number of operations or types of information which are not in themselves a part of the control procedure. This information, which varies in importance with the size of the concern and the complexity of its operations, is tabulated to show its need in small, medium, and large companies—a check list useful to many executives in analyzing the basis for control system.

"Controlling Factory Production" also outlines the functions of the foreman and the supervisor in executing planned production.

Copies of this report are available to executives who address the Bureau on their business stationery. Address: Policyholders Service Bureau, Metropolitan Life Insurance Company, One Madison avenue, New York, N. Y.

Waste Paper Supply Improving

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 28, 1943—All the usual indices of the summer seasonal business in the paper trade are encouraging, thereby indicating a more cheerful frame of mind than has prevailed for sometime, and more recreation is being planned even though it has to be done on a wartime basis. Encouraging indeed are reports in the movement of waste paper products into consuming mill channels. The mills have been drawing on their surpluses, and quite a few who hitherto had not come into the market are clamoring for these products. The dealer, who is hard hit by the shortage of manpower in collecting, sorting and baling waste paper, etc., and the small margin of profit because of ceiling prices working a hardship on him, does not have the incentive he ordinarily would have to handle this influx of orders. Then, too, shipping facilities have to be reckoned with on account of government priorities for shipping supplies and munitions for our service men. When it is estimated that an average box car holds supplies and equipment for but four service men, the need of all available cars will be readily realized.

C. L. Christensen Joins Celotex Corp.

Chris L. Christensen, dean of the University of Wisconsin College of Agriculture until his resignation last Friday, has become today vice president in charge of postwar development of the Celotex Corporation, Bror Dahlberg, president, announced.

Mr. Christensen, who has been a Celotex director since March, 1942, will also have charge of the corporation's agricultural interests, and will devote considerable time to the building problems of the farmer.

Corn Processing Plants Close

The continued and unprecedented scarcity of corn supplies at the terminal markets necessitated the closing of three of the largest corn refining plants manufacturing starches, syrups, dextrose and other products of corn.

First to shut down was the Pekin plant of the Corn Products Refining Company at Pekin, Ill., with a daily grinding capacity of 60,000 bushels of corn and employing 1200 workers. This plant closed Monday, June 21. It was followed four days later by the shut down of the American Maize-Products Company plant, located at Roby, Ind., just outside of Chicago; and then by the closing of the Clinton Company plant at Clinton, Iowa. Each of the two employs about one thousand workers and each has a daily corn grinding capacity of 40,000 bushels.

These three plant shut downs account for about one-third of the corn refining industry's total productive capacity, according to the Corn Industries Research Foundation, and they represent a serious threat to the availability of starches and dextrins, which products are essential in large and continuous quantities to the operations of paper and box board manufacturers who employ them in all divisions of their industries.

In New York executives of the industry saw one or two cheerful aspects in this otherwise gloomy situation. They expressed the belief that the government representatives now recognize the fact that the output of the corn refining plants is vitally needed in the war effort and that unless the necessary corn supplies are found the execution of many important war contracts may be seriously hampered. Furthermore, since the corn supplies needed are only a small fraction of the total corn crop—last year's corn grind of 130,000,000 bushels was only four per cent of the total corn crop of 3,200,000,000 bushels—they are hopeful that adequate supplies may be found without great delay and without disruption of the current over-all corn situation.

TAPPI Notes

Change in T 433 m-41: The TAPPI Official Standard T 433 m-41, Water Resistance of Paper (Dry Indicator Method) specifies two procedures for making the test. Results of tests made at the National Bureau of Standards indicate that Procedure A does not give consistent results on certain types of water resistant papers. The TAPPI Paper Testing Committee has therefore recommended that Procedure A be deleted from this standard and this has been approved by the Standards Committee. The subject is being further investigated and it is intended to reissue the standard later in revised form.

Eugene Kane, formerly of the American Can Company, is now research chemist for Continental Foods, Inc., Hoboken, N. J.

Testing Machines, Inc., is now located at 427 W. 42nd street, New York, N. Y.

Benton R. Cancell, formerly of the U. S. Pulp Producers Assoc., is now with the Canadian Division, War Production Board, Ottawa, Ont.

Cleveland Container Starts "V" Shift

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., June 26, 1943—The Cleveland Container Corporation has inaugurated a "V" shift at both of its local plants in maintaining pace with the nation's wartime industrial progress, according to announcement. The new shift means that ordinary day and night shifts can be stretched to nine and one-half hours while the "V" workers account for five hours between the working hours of the two shifts of workers. The "V" shift workers also turn in a ten-hour day on Sundays. At the present time only ten men are employed on the "V" shift but others will be added as rapidly as equipment is provided them, according to the management. The workers on the new shift are all employed at other jobs during the daytime. At present 125 employees are engaged at the two plants and new help is being added as rapidly as equipment is set up in the two plants. Lack of paper has cut production somewhat and during the past week it was necessary to suspend operations at the silk mill for a few days when paper failed to arrive for the containers.

However, it was stated that a supply arrived late this week and more is on the way.

W. H. Fox & Sons Close Mill

PENN YAN, N. Y., June 28, 1943—The W. H. Fox & Sons paper mill, operated for 78 years as a paper manufacturing plant, has suspended operations, according to John C. Fox, president of the company.

The mill was founded in 1865 by the late William H. Fox, pioneer in the manufacture of paper from straw.

The mill was purchased by W. H. Fox from the firm of Youngs & Hewins, originally used for manufacture of flour, feed, plaster and as a saw mill, Mr. Fox converting it into a paper mill.

Several factors entered into the closing of the plant which has employed approximately 30 men. About a month ago, the mill dam in Keuka Outlet gave way under the weight of increased water caused by rising of the Keuka Lake level due to excessive rains. Transportation problems and outlook for supply of straw due to decrease in grain acreage caused by the late rainy season, also are factors which enter into the suspension of operations.

Officers of the company are: President, John C. Fox; vicepresident, Albert T. Beardslee; secretary-treasurer, John E. Birmingham.

New Mechanical Books

The Chemical Publishing Company as currently published three books of value to technical men in the paper industry.

Glue and Gelatin by Paul I. Smith, (145 pp.) This covers the chemistry of proteins, extraction, and properties of glue and gelatin, adhesives and other applications. (Price $3.75.)

Synthetic Adhesives by Paul I. Smith, (125 pp.). This includes the phenal-formaldehyde, urea formaldehyde, polyvinyl, cellulose ester, acrylic, polystyrol, alkyd, chlorinated rubber, and synthetic rubber products. Useful formulas are given. (Price $3.00.)

Manual of Laboratory Glass Blowing by R. H. Wright, Assoc. Prof. of Chemistry, Univ. of New Brunswick (90 pp.). It covers glass, gas burners, tools, fundamental operations, the splicing torch, and special operations. (Price $2.50.)

These books may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y.

WPB To Strictly Control Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 30, 1943—Demands of the several Claimant Agencies for paper and paper products have become so insistent and the shortages of wood pulp so severe that the War Production Board has found it necessary to assume control over the use of all grades of wood pulp, it was announced today.

The WPB Pulp and Paper Division is empowered to direct the use of any or all wood pulp by manufacturers of paper, paperboard and other products, under General Preference Order M-93 as amended and issued today. This will ensure that sufficient wood pulp is reserved for the production of essential paper and paperboard products as well as for the manufacture of certain essential products of the chemical and textile industries.

Until May, 1943, War Production Board exercised control only over delivery of pulp and its acceptance by consumers. On May 4, 1943, however, the "withholding' clause of M-93 was invoked by the issuance of Supplementary General Preference Order M-93-a, which enabled the Pulp and Paper Division to require the withholding of pulp by pulp producers for delivery as directed by WPB. Subsequently, producers of pulp were directed to withhold 20% of all pulp produced during June and each month thereafter, and to make deliveries of such withheld pulp only at the direction of WPB. This action was prompted by the necessity for ensuring the availability of wood pulp for essential uses.

In issuing the amended order M-93 today, it was explained that the wood pulp situation is now so critical that it is necessary to control the uses of pulp for the following reasons:

To allocate the various grades of wood pulp for the production of the amounts and kinds of papers, paperboard and other products needed in the war effort, and to restrict or eliminate the use of wood pulp in the manufacture of the less essential papers. By withholding allocations of the scarcer wood pulp grades, it was explained, it will be possible to encourage manufacturers of paper and paper products to utilize pulps and other fibrous materials which are in relatively greater supply, such as groundwood and waste or reclaimed paper, thus conserving the scarcer grades of wood pulp.

In the future, therefore, the WPB will be able, from time to time, as necessary, to direct each consumer of wood pulp as to the types of paper, paperboard and other products into which he may convert his allocated wood pulp.

Consumers of wood pulp are required under M-93 to file their orders with producers of pulp by the second day of each month on Form WPB-697, which is the same as the form previously numbered PD-290. Starting with the month of July, consumers are directed to apply by the fifth day of each month to WPB on Form WPB-2973 for paper and paperboard mills or on WPB-2974 for mills making non-paper products for authorization to use specific quantities of wood pulp during the following month. It is also required that all consumers file with WPB by the 12th of each month Forms WPB-698, covering their monthly consumption, inventories and estimated receipts of pulp and other fibrous materials. This Form WPB-698 replaces Form PD-291 previously used. Similarly, all producers are required to file with WPB by the 12th of each month Form WPB-699 which is the same form previously numbered PD-292, showing their proposed shipping schedules for the following month.

No deliveries of pulp are permitted without express authority of WPB, except small quantities, which are defined as not exceeding one ton of any grade of pulp during a calendar month.

A detailed explanation of the new procedure will be sent to all producers and consumers of wood pulp before July 1, it was stated by the Pulp and Paper Division. Allocations of wood pulp for August shipment will probably be made under the amended order at the next meeting of the Wood Pulp Allocation Committee on July 19, 1943.

Michigan Division To Meet

The Michigan Division of the American Pulp and Paper Mill Superintendents Association will hold its Annual Summer Meeting on Friday, July 16, at the Kalamazoo Country Club in Kalamazoo.

The Golf Committee, composed of Jack Dickson, Roy Holden and Al Sherwood, announce that golfers will tee off at 1:00 p. m. and that refreshments will be served on the nineteenth hole.

Dinner will be served at the Country Club at 7:00 p. m.

Following dinner, Robert F. "Sandy" Kohs, of the Detroit Sulphite Pulp and Paper Company, will be presented with a certificate of life membership in the superintendents association.

Those who are planning to attend are earnestly requested to make reservations by July 12. Reservations may be mailed to Joe Waber at the Rex Paper Company.

Reports Err Regarding Cascade Mill

An erroneous report has appeared in some of the daily newspapers to the effect that Brown Company has closed its Cascade Mill at Berlin, N. H. Actually only the pulp operations conducted at that mill will be suspended as of July 4, after which date all pulp will be produced at the company's Burgess Pulp Mill which is the main pulp mill at Berlin.

Cascade Mill has always been primarily a paper mill and is currently producing papers for war and essential civilian products. Its paper making operations will be in no way affected by the consolidation of all pulp production at the Burgess Mill.

Pulpwood Prices Amended

The Office of Price Administration on June 24, issued amendment No. 1 of Maximum Price Regulation No. 361, covering pulpwood produced in the states of Maine, Vermont, New Hampshire, and New York. The price schedule for Zone 1, State of Maine is as follows: Spruce and Fir—Rossed, $17.25, Peeled, $16.25; Rough, $14.25; delivered mill boom by vessel via tidewater.

The price schedule for Zone 4, New York State, (Lake or Stream) follows: Spruce and Fir—Rossed, $19.75; Peeled, $18.75; Rough, $15.75.

Simplification of Toiletries Boxes

The recently proposed simplification of paper boxes used by the manufacturers of toiletries and cosmetics for over-the-counter trade has been approved for promulgation, according to an announcement by the Division of Simplified Practice, National Bureau of Standards. The voluntary recommendation will be effective from July 1, 1943, for new production.

The purpose of this recommendation is to reduce the amount of paper board used for packaging toiletries and cosmetics. This is accomplished by establishing the maximum thickness of paper board used for these boxes, by restricting the size of box in relation to the size of the contents, and by limiting the number of protective covers or containers. The recommendation also provides for simplification of designs to reduce frills which are wasteful of critical materials.

The reduction in the sizes of individual boxes should reduce the size of shipping containers for the same number of unit packages, thereby effecting additional savings in material, transportation and warehouse space. One large user has estimated that this simplification will enable him to effect annual savings of more than 150 tons of paper board.

Mimeographed copies of this recommendation may be obtained upon request from the Division of Simplified Practice, National Bureau of Standards, Washington, 25, D. C.

Criticizes Newsprint Cut

WASHINGTON, June 28, 1943 — Representative Grant (R., Ind.), charged today that the nation's press is being "choked to death by the flood of government handouts" and that the proposed additional 5% cut in newsprint "strikes out at the jugular vein of our free press."

"There isn't a newspaper publisher in the land who would hesitate at taking his prorata share of any necessary cut and even more, if he felt that the government was setting a good example," Mr. Grant said.

He said 3200 government publicity agents "still flood the country with handouts on every conceivable subject under the sun—that end up in newspaper waste baskets." These only add to our supply of waste paper, he said.

Ask Ample Pulp Supply

PITTSBURGH, Pa., June 25, 1943—The board of governors of the International Allied Printing Trades Association sent telegrams tonight to President Roosevelt, the War Production Board and the War Department urging that steps be taken to assures a constant and ample supply of wood pulp and pulp products, including paper.

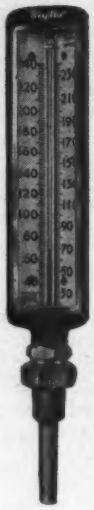
The Government was urged to cooperate with Canada to use "a sufficient number of German and Italian prisoners, now here or those to come, in the forests."

Stone Paper Tube Co. to Build

WASHINGTON, D. C., June 28, 1943—Stone Paper Tube Company, Inc., will build a $20,000 one-story brick addition at 900-922 Franklin Street Northeast. J. H. DeVeau & Son are the builders and F. C. Almirall and R. O. Cuppy, the designers.

New Industrial Thermometer Design

Motivated by a desire to save critical metals in war time, Taylor Instrument Companies, Rochester, N. Y., have designed, tested in the field, and are now introducing a one-piece industrial thermometer.



The one-piece case is shallower which makes it possible to see the mercury column through a wider angle of vision. The chromium-plated bezel fits snugly into the grooved case in such a way as to hold the thick glass front securely against four wavy tension springs. These springs are fastened securely under the scale by shakeproof screws. This construction results in a dustproof, rattleproof, and practically fumeproof thermometer. It can withstand vibration and severe shocks.

These improvements combined with permanent accuracy, responsiveness to change in temperature, and durability, plus a saving of tons of critical bronze, make the new instrument of great interest to industrial thermometer users.

The company has announced further that the new instruments will be equipped with easy-reading Binoc tubing. They will be furnished in many combinations of straight and angle stems, with threaded or union connections, and in many standard temperature ranges, within the limits of —40° F. to +750° F. Standard scale lengths are 7 inches and 9 inches. Numerals are bold and clear, standing out sharply against a contrasting background. Interested persons should write to the company for Bulletin No. 98030.

No Effect on Powell River

Reported curtailment of 12 per cent in United States newsprint production will have no effect on mill operations at Powell River, B. C., D. A. Evans, resident manager of the Powell River Company, has announced.

Commenting on the reports Mr. Evans said: "In connection with a statement that there will be a curtailment of 12 per cent in newsprint production in the United States, the management of the Powell River Co. Ltd. advise that this will not affect the Powell River mill, where operations are controlled by the log supply.

"The log supply is such as will permit the continuance of our operations under the present schedule unless some unforeseen circumstances arise. The supply of logs is expected to carry on the present output of newsprint and pulp until the end of the year, and to permit of the building up of a log storage to carry over the winter months."

Algonquin Paper Corp. Suspends

OGDENSBURG, N. Y., June 25, 1943 — The Algonquin Paper Corporation suspended operations indefinitely today after having been closed since June 4 because of pulpwood and labor shortages and a wage dispute, Frank A. Augsbury, the owner, said.

Eighty plant employees and twenty-five longshoremen automatically received manpower releases from the corporation, which had operated continuously for twenty-one years.

Anacortes Pulp Mill to Resume

ANACORTES, Wash., June 28, 1943—Word has been received at the office of the Anacortes Pulp Company, from their office at Coos Bay, Ore., that the War Labor Board has granted them permission to resume operations at the Anacortes plant after an eight months shut-down.

This will mean that as soon as the plant can be put in readiness for operation and a crew can be assembled, production will again be under way at the local mill. About seventy men are usually employed in the pulp mill and an additional fifty at Morrisons are affected by the operation of the plant. It is believed that about a month's time will be required to make ready for the resumption of operations.

The Anacortes Pulp mill was closed by order of the War Labor Board on November 1, 1942, along with the Tacoma mill of the St. Regis Paper Company and the Tacoma mill of Rayonier, Inc. All three of these mills are producers of pulp normally shipped east.

The closing action was taken, according to an announcement by the WLB, "in order to make sure that the shortage of manpower and pulp logs would not imperil the production of high alpha and dissolving pulps which go into essential nitrating, rayon and photographic uses."

About 1,100 men were affected by the order closing the three mills, most of whom have doubtless found employment in various phases of defense work.

At the time the local plant was closed, employees thrown out of work by the closing order were given a bonus of a week's pay if they had been on the payroll prior to July 1, 1942. Men who had been employed on an hourly basis since July 1, were granted a bonus of 20 hours pay. A few employees were kept on the payroll during the shut-down to act as watchmen, guards, etc.

John McKirdy, Jr., who was the manager of the company here, a subsidiary of the Scott Paper Company, at the time the plant closed, has since left for the east and J. R. Lewis is now in charge of the mill.

Barrell's Paper Annual

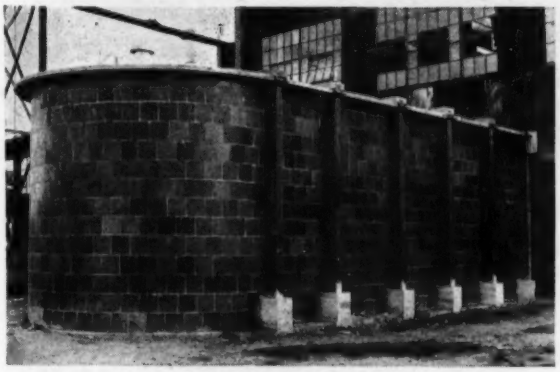
A review of the war record of the paper industry is presented in the 1943-1944 edition of Barrell's Paper Annual, published by William L. Barrell Co., 52 Chauncy Streeet, Boston, Mass.

The contents include, under the title of "The paper industry in wartime," by E. W. Tinker, executive secretary of the American Paper and Pulp Association, a summary of the important contribution which the industry has made and continues to make in the war effort. "Paper's part in the war," is discussed by William Bond Wheelwright. The chapter on "Paper prevents bottlenecks," edited by Vincent F. Waters, technical assistant to the secretary of The Technical Association of the Pulp and Paper Industry, describes the essential paper and allied products which have been exhibited by the association.

Other chapters cover "Pulp and paper education at the University of Maine," by Prof. Paul D. Bray, and Dryer felts in wartime.

The volume contains a directory of officials of the associations representing various divisions of the paper and pulp industry.

You Paper Mill Men • take a Tip on Kalamazoo Tile Stock Tanks and Chests • you can't beat them for STRENGTH and DURABILITY •



Kalamazoo Vitrified Glazed Tile

is a "Natural" for Paper Mill Needs—

Smooth, hard, strong, easily cleaned and highly resistant to chemical action, this marvelous vitrified glazed tile type of construction is preferred by scores of leading paper mill executives and engineers. Adaptable for stock tanks and chests of all kinds. Costs no more than concrete tanks that require constant maintenance expense.

An exclusive method of glazed tile tank construction developed by Kalamazoo engineers. It provides greater flexibility and lower cost for all paper mill stock handling problems. Immediately available.

● Any Size or Shape Desired—

Wide, narrow—shallow or deep. Round, rectangular or square. Half-round or tapered bottom and corners. Midfeathers and fins where needed to control stock flow. Adaptable to pumps or agitators. Construction individually designed to meet space, tonnage or production requirements.

Ask for Engineering Data.

Kalamazoo TANK & SILO CO.
KALAMAZOO - MICHIGAN

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending June 26, 1943

STOCKS

	High	Low	Last
A. P. W.	2¾	2¾	2¾
Armstrong Cork Co.	38⅝	36⅜	38
Celotex Corp.	13⅞	12⅝	13⅞
Celotex Corp., pf.	91	90¼	91
Certain-Teed Products Corp.	7⅛	6½	7
Certain-Teed Products Corp., pf.	58	55⅛	57⅜
Champion Paper & Fibre Co.	21⅝	21½	21⅝
Champion Paper & Fibre Co., pf.	104	104	104
Congoleum Nairn Co.	23¾	22½	23¾
Container Corp. of America	22⅞	22¼	22⅜
Continental-Diamond Fibre Co.	15½	14	15⅜
Crown-Zellerbach Co.	15⅜	14⅝	15¼
Crown-Zellerbach Co., pf.	94½	93½	93½
Dixie Cup Co.	14½	14	14½
Dixie Cup Co., A	42¾	42	42¾
Flintkote Co.	21⅜	19¾	21⅜
Flintkote Co., pf	101½	101½	101½
Robert Gair	3¾	3½	3¾
Robert Gair, pf.	....	....	....
International Paper Co.	12½	11½	12¼
International Paper Co., pf.	58⅜	56¾	58⅜
Johns-Manville Corp.	86½	85¾	86½
Johns-Manville Corp., pf.	132	130	130
Kimberly-Clark Corp.	31⅞	31	31¾
MacAndrews & Forbes	28	26¾	26¾
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	39¼	38¼	39¼
Mead Corp.	9⅞	9	9½
Mead Corp., pf. A-6%	....	....	....
Mead Corp., pf. B-5½%	72½	72½	72½
Paraffine Companies, Inc.	41¼	40	41¼
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	15½	13¾	15¾
Rayonier, Inc., pf.	30	29¼	29¼
Ruberoid Co.	26½	24⅝	26½
Scott Paper Co.	40¾	40¾	40¾
Scott Paper Co., pf.	115	113	113
Sutherland Paper Co.	30	30	30
Union Bag & Paper Corp.	11⅛	10⅝	10⅞
United Paperboard Co.	5½	5½	5½
U. S. Gypsum Co.	72	69¼	72
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	15½	15	15
West Virginia Pulp & Paper Co., pf.	108	107⅞	108

BONDS

Abitibi Pulp & Paper Co. 5s '53	76⅞	76⅞	76⅞
Celotex Corp. 4½s '47	101¾	101¾	101¾
Certain-Teed Products Corp. 5½s '48	99¾	99½	99¾
Champion Paper & Fibre Co., 4¾s '50	....	....	....
International Paper Co. 6s '55	106¼	106	106¼
International Paper Co. 5s '47	104¾	104½	104¾
Mead Corp. 3¾s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending June 26, 1943

STOCKS

	High	Low	Last
American Box Board Co.	7¾	7¾	7¾
Brown Co., pf.	....	....	....
Great Northern Paper Co.	33	33	33
Hummel-Ross Fibre Corp.	4⅛	4	4⅛
National Container Corp.	11¾	11⅝	11¾
St. Regis Paper Co.	4	3⅜	3⅞
St. Regis Paper Co., pf.	130¼	129½	129½
Taggart Corp.	4½	4⅜	4½

BONDS

American Writing Paper Co. 6s '61	94¼	94	94

Denies I. P. Merger Appeal

The New York state public service commission has denied the petition of several International Paper Company subsidiaries to merge and modify their capital structure for the alleged purpose of effecting annual savings in interest charges and substituting stock for notes payable to the holding company.

The petition is that of the Eastern New York Power Corporation, the System Properties, Inc., the Hudson River Power Corporation and the International Hydro-Electric System. Long defunct paper mill properties at Glen Park and at Piercefield of the International Paper Company have for some time been held by subsidiaries since the mills went out of operation.

The International Paper Company was formed in 1898 and took over among other properties the three Remington mills at Glen Park and the Piercefield Paper Company. They were operated directly by water power. Eventually the Glen Park mills ceased operation, were torn down and the water power reverted to undevelopment.

The Piercefield mill is also in disuse and the power likewise.

In the case of other International Paper Company properties water power was divorced from the paper production and hydro-electric plans constructed since 1931.

To meet this situation subsidiary companies were formed. The International Hydro-Electric System and the System Properties, Inc., took over such properties as were not previously covered by a mortgage given by International Paper. The Hudson River Power Corporation took over the ones which were covered by mortgage.

Under the planned merger and refinancing, the petitioners claimed the $8,000,000 first mortgage bonds due June 1, 1961, would enable reduction of the funded debt from $13,968,000 to about $5,968,000 in 18 years. The report of the commission states that there is an apparent write-up between $13,105,000 and $5,144,000 in the value of non-operating properties and $513,729 in operating properties.

Because the several requests of the petitioners are so interdependent, the commission deems it wise to deny the petition in toto rather than to grant those which might legally be allowed.

Celotex to Split Shares

Stockholders of the Celotex Corporation have voted to split each share of $100 par value 5% cumulative preferred stock into five shares of $20 par value 5% cumulative preferred stock.

Stockholders also approved the issuance and sale of 134,067 shares of common stock at $10.50 a share. Of this, not more than 70,226 shares may be offered to present common shareholders on the basis of one new share for each ten shares held and 63,841 shares may be offered to employes, officers and directors.

Fort Orange Paper Co. Elects Officers

At the annual election of the Fort Orange Paper Company held recently at Castleton, N. Y. the following directors were elected: W. Gordon Latham, Robert S. Harris, Arthur C. Schroeder, Richard E. Dwight and Robert C. Poskanzer.

Container Corp. Votes Dividend

A dividend of 25 cents per share payable August 20, 1943 to stockholders of record August 5, 1943 was declared by the Board of Directors of Container Corporation of America at a meeting in Chicago on June 23.

P. A. S. C. Meeting

The Papermakers and Associations of Southern California held a meeting at the Rosslyn Hotel, Los Angeles, Cal., June 17, 1943.

At this meeting the resignation of vice chairman W. T. Tillotson was received. As recognition of his interest and support of PASC, Tillotson, who was one of the charter members, was made an honorary life member of the group by unanimous vote of the members. Chairman W. A. Kinney, acting for the Executive Committee, appointed Frank H. Wheelock of Fibreboard Products, Inc., to fill out Tillotson's term as vice chairman.

On behalf of the Executive Committee of the Pacific Section of the Technical Association of the Pulp and Paper Industry, H. A. Des Marais presented the Shibley Award to Robert A. Baum of the Fernstrom Paper Mills for his paper entitled "The Effect of Alum Floc on the Strength Characteristics of Sulphite Pulp" which had previously been presented at the March meeting of the TAPPI Section at Portland, Ore. Baum presented his prize-winning paper before the PASC members and guests.

The program was concluded by the showing of an interesting motion picture film, "The World at War."

Among those present were: R. A. Baum, K. H. Bearse, W. Belleman, Herman Berg, Bruce F. Brown, Bruce F. Brown, Jr., Grover C. Brown, V. P. Cole, Robert E. Cooper, Roy Culp, George M. Cunningham, H. A. Des Marais, Frank E. Dilley, C. E. Eberhard, J. J. Erchul, Charles Frampton, Carl H. Greve, J. E. Hartford, A. H. Hatch, W. A. Kinney, S. J. Knowles, William J. Krodel, C. W. Kyle, Russell J. La Narz, Elmer A. Lemire, Harry Lilburn, F. L. Mark, R. H. Maxwell, William R. Monette, William A. Moore, J. Van Ousem, Stanley Peterson, Glenn Phillips, L. I. Ramsey, Otto Sass, E. Shaughnessy, William Sheenan, E. G. Swanberg, A. M. Turner, Frank H. Wheelock, Henry B. Will, and Wm. C. Zietz.

Current Imports of English Paper

Current imports of English paper consist of filtering paper, hand made drawing paper, duplex decalcomania, carbonizing tissue and pottery tissue. Occasional shipments of other grades are received, but this list comprises practically all the paper now being received from Europe, according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry.

The duty rate on vat-lined board, 80 points in thickness, is under consideration by Customs officials, the question being whether it is dutiable as vat-lined board or as test board. The board meets the technical requirements for either classification and the Customs officials are trying to determine its commercial designation in domestic markets in order to decide whether to collect duty at $14.50 per ton as vat lined board, or at 20 percent as test container board.

The question whether kraft converting papers and kraft wrapping papers are to be valued alike for duty purposes has arisen at Detroit. The Customs officials have been furnished with information by the Import Committee showing that the paper industry in its statistical records segregates bag paper from wrapping paper, just as envelope kraft and other converting krafts are separately classified.

APPLETON paper mill machinery

installed in times of peace is doing its part in the manufacture of paper for war. Extra strength and structural refinements were built-in to guarantee maximum machine life and long, dependable service. Periodical checking of equipment is practical in normal times. Now, with present restrictions, a thorough inspection at regular intervals could easily be the means of saving machinery that is difficult to replace. When needed, we can supply you with repair parts, under proper priorities. Helping to keep paper mills operating is a part of our full production for victory.

MAINTENANCE

THE APPLETON MACHINE COMPANY
APPLETON WISCONSIN

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 117 July 1, 1943 No. 1

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Palmer House, Chicago, September 21-24, 1943.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

RATIONING AND PRICE CONTROL

One of the chief cited causes for criticism of the price fixing policy of the Office of Price Administration, is that the agency has too closely followed the policy as inaugurated in Great Britain. A second point which has been very much under controversial discussion, is that the OPA has not adopted a realistic policy in the adjustment of equitable prices, due to higher costs. The failure of the OPA, so runs one argument, to make such reasonable and just changes in prices to include higher costs than was originally considered in establishing base prices, seems to be substantiated in considerable part by the adverse effects reported in operations among many types of business enterprises.

Few persons will disagree that effective control of the inflationary trend and abnormal activity brought about by the war, is essential. It is also generally conceded that the business enterprises of the nation must be preserved. The home front must be strong to keep the war front strong, and a relatively high rate of productivity of goods for civilian consumption is requisite to properly sustain the home front and maintain the war economy. The inherent weakness in the current policy of the OPA appears to be in part due to a lack of good business judgment in balancing the production and distribution of civilian goods, against the essential requirements for war use. The error of the WPB is similar in its effects and lies in estimating the actual needs of a war economy without providing sufficiency for the home front. The shortage of essential farm machinery and equipment is one serious mistake by the WPB, and the insistence of drafting labor from the farms by the Selective Service, is also a deterrent factor in the food supply situation. The pulpwood supply situation is another instance. The error of the OPA in what appears to be undue insistence in keeping prices down to control inflation, does not permit prices to rise sufficiently to establish an equitable level to provide a just or fair profit to business. In other words, criticism states, the efforts of the OPA to keep prices down is keeping prices too low. This has checked inflation, to be sure, but it has also forced general civilian business activity too low, and thus business in general has been impaired.

Rationing has also operated to reduce the volume of civilian trade and the OPA has been criticized by adopting what has been termed a "stubborn adherence to a theoretical and arbitrary price fixing policy," not entirely warranted by the factual situation of supply and demand. Some of this criticism has been on the basis of a too fixed adherence to the policy as adopted by Great Britain. However, one views a controlled economy and the policies of rationing materials and products adopted by the War Production Board, and prices fixed by the Office of Price Administration, it is plain that wartime conditions entail substantial sacrifices of profits and comforts for all civilians; that privileges normally enjoyed must be sharply abridged to meet the wasteful, though essential, demands of war. The main point of essentiality is, however, whether or not current policies of these government agencies cannot be improved to create a better balanced economy between civilian needs and military requirements. Considerable improvement in this desirable direction appears to be a reasonable expectation.

As Great Britain quite early in the war established a plan of rationing and price control, the United States has quite closely followed this precedent. In a study of "Rationing and Price Control in Great Britain," by Jules Backman, published by The Brookings Institution, Washington, D. C., the fundamentals of the controlled war economy in Great Britain has been clearly presented. In its first chapter the pamphlet, (No. 50) states in part: "Price fixing and rationing are now considered indispensable wartime measures in all belligerent and many non-belligerent countries. As the proportion of a nation's resources devoted to the war effort is increased, these controls become of growing importance in the 'battle of the home front.' However, the tremendous distortions attending 'total war,' when imposed upon a very complex economic system, have made the application of such controls an extremely difficult task. Typical problems and questions which have arisen in other countries and which are faced by the United States include: the effect of price fixing upon the flow of supplies and production; black markets; the relationship between rationing and price control; the control of non-standardized and perishable products; the stages of production and distribution at which control should be imposed, the extent to which substitute products should be con-

trolled; the role of subsidies; breaking of the cost-price inflation spiral; condition under which price rises should be permitted."

The Brookings study goes on to say that, "In some quarters one encounters the belief that if the British have used a control we should also use it. Another group insists that if the British have followed a certain course, it should not be adopted here. . . . Some phases are not applicable to the United States because of differences in institutions and in the structure and organization of the economic systems of the two countries. . . . But despite these differences, many problems common to both countries have arisen, and the solution of these problems as we encounter them, the British experience should prove valuable to us."

Left-Over Wood for Pulp Products

Research is one of the Northwest timber industry's most effective forms of protection against future forest famine as well as a first-rate investment, according to Bror L. Grondal, professor of forest products at the University of Washington, who addressed the annual meeting of the Western Lumber Manufacturers' Association at Hotel Georgia, Vancouver, B. C., recently.

One of the country's foremost advocates of fuller forest utilization, Prof. Grondal suggested that logging operators should derive profit from thousands of tons of debris now going to waste by installing small portable units in the logged-off areas to convert left-over wood into crude pulp products.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1943		Corresponding Weeks, 1942	
May 15	91.1	May 16	97.8
May 22	92.7	May 23	93.9
May 29	92.7	May 30	91.4
June 5 (incl. Memorial Day)	85.5	June 6	90.2
June 12	88.3	June 13	88.4
June 19	*87.5*	June 20	86.5

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.2	88.8	89.5	88.7	*91.7*	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1942	80.8	82.8	90.6	86.9	80.1	90.4
1943	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date..	78.2	89.1	67.4	79.6	86.8	93.1	99.7	*88.9*
Year Average..	80.4	79.8	71.5	83.4	85.6	97.4	90.4	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	*96*								

Week ending May 15, 1943—96
Week ending May 22, 1943—96
Week ending May 29, 1943—95
Week ending June 5, 1943—92
Week ending June 12, 1943—97
Week ending June 19, 1943—95

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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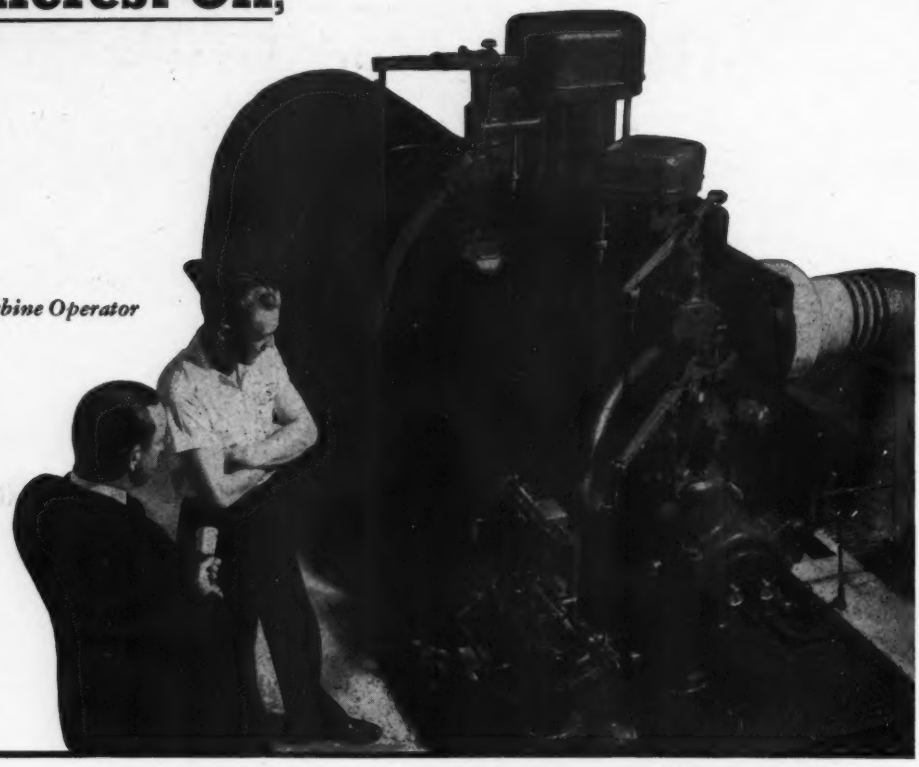

Actual plant photo of a Gulf Lubrication Service Engineer (left) consulting with Turbine Operator of the world's largest cigarette paper mill on steam turbine lubrication.

"All lubricated turbine parts — and the oil in the reservoirs — were found to be in their original condition."

"When we recently dismantled this turbine for inspection, it showed the results of excellent lubrication," says this Turbine Operator. "All lubricated parts were found to be in their original condition, with no measurable wear. The oil in the reservoirs was also in perfect shape. This inspection proved to us again the higher lubricating value and greater stability of Gulfcrest Oil."

Here is the important reason why Gulfcrest Oil has such an outstanding record of performance in steam turbine lubrication: Gulfcrest Oil is not only refined from the best selected crude oils—it is *super*-refined by the Gulf Alchlor Process, the most effective method known for removing the undesirable constituents present in all crudes. Thus Gulfcrest Oil has highest resistance to oxidation, acidity and sludge, and provides maximum protection to turbine bearings. Gulfcrest Oil is the world's finest oil for turbine lubrication!

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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY

Edited by R. G. Macdonald, Secretary

Developments and Trends in New Paper Products

By Robert J. Zaumeyer[1]

Abstract

The objective of the War Products Development Section is the encouragement and expediting of the development of paper war uses. Some of the new war uses which may or may not carry over to the postwar period are discussed.

There is nothing so constant as change—especially in a global war. Winning the fight is foremost in the minds of all of us in the paper industry, and *paper is on the firing line.* We have learned that the military struggle is only the first part of winning a war. It is equally necessary to think about winning what we are fighting for. What are our plans when the shooting war has been won? Among the results of this war are enormous strides in technology, leading to a new industrial revolution and the development of world-wide contacts for American products and American standards of living.

The pulp and paper industry has given much to the war and it will gain much from the war. This cubic struggle has given the paper industry a tremendous stimulus in the development of new and improved products. The war has also marked certain definite trends for the industry which will have a far reaching effect.

The background and accumulation of experience in the applications of paper to ordnance, chemical warfare, air force, and naval requirements will lead to many additional peacetime uses. The war should provide a key to many new outlets. The War Products Development Section of the Pulp and Paper Division of the War Production Board has had as its objective the encouragement and expediting of the development of paper and paperboard for war uses. There are many war babies, of course, that will not live in the postwar era because of economic considerations. However, there are many that will continue to thrive in the peace because of their merit and their contribution to progress.

Wet Strength Papers

The high-wet strength papers are most interesting and the possible uses are innumerable. Here, the industry feels the impact of the plastics industry in its use of urea-formaldehyde and melamine-formaldehyde resins. Wet strength in paper is not new, but the discovery that these resins could be used in the papermaking process has accelerated activity in this field.

The "beater" application particularly adapts itself to the average mill. Melamine has exhibited good retention by the fiber, and wet tensile strengths of 50% of the original dry strengths are obtainable. Wet bursting and wet rub resistance are improved remarkably. Additionally there are marked increases in dry strengths especially in fold endurance.

Wet strength techniques have been applied to many war uses for paper. Map and chart paper has gone modern in this respect. Modern warfare requires more durable maps as evidenced by Captain Rickenbacker's experience when his maps disintegrated in sea water. The new map papers can be used in the rain or immersed for long periods in sea water without failure. They can be washed free of mud, grease, and blood without fear of disintegration.

Camouflage paper must exhibit these properties in addition to good dry strength and flexibility. Many Army and Navy manuals that are used in all kinds of weather are being printed on high-wet strength papers for obvious reasons. Lightweight tissue papers developed for specific functional end uses have been remarkably improved.

In the packaging field, this discovery will further improve the multiwall paper bag and enlarge its already wide scope. The multiwall bag makers have done an outstanding job in substituting for critical burlap and metal containers for the shipping of many commodities. It is reported that one billion multiwall paper bags were consumed in 1942. Many foodstuffs such as sugar, rice, flour, salt, peas, and dried beans are reaching our soldiers overseas in specially designed paper shipping bags. The bags are scientifically designed to deliver their contents to China, the Solomon Islands, Iceland, Russia, and many other spots on this globe. The construction of the bags varies from 3 to 6 walls and offers a wide range of packaging possibilities.

Many materials other than foodstuffs, such as calcium chloride, chemical fertilizers, cement, lime, pigments, and other items of commerce are using up millions of these bags for 100-pound units. Rosin and some types of asphalt are poured in a molten state from extremely high temperatures, approximately 551°F., into multiwall bags without any dam-

* Presented at the meeting of the American Pulp and Paper Mill Superintendents Association, Hotel Commodore, New York, N. Y., June 15-17, 1943.

[1] Chief, War Products Development Section, Pulp and Paper Division, War Production Board, Washington, D. C.

age to the bags. These materials, on cooling, congeal in the bags.

The hazards that paper shipping bags are meeting cover climatic changes, exposure to insects, rain, salt water, ice, heat, and tropical humidity.

The type of paper that makes up the multiwall construction is strong kraft. The water-resistant barrier generally used in this construction has been asphalt-laminated paper. Within the last year, wet strength paper, in single or multiple plies, has been used. It is reported that certain constructions have resisted 24 hours of complete submersion in water. This container will continue to hold its place after the war.

In the realm of twisting papers, one can picture new frontiers with higher dry and wet strengths. Our section in WPB is actively expediting a substitution project for binder twine. The United States and Canada require over 250,000,000 pounds of binder twine each year for harvesting wheat and oats. This twine is normally made of the hard fibers: namely, sisal and henequen. Due to heavy naval demands for rope, these fibers have become exceedingly critical and it is essential that an alternative be found to extend our supply. Twisted kraft paper is a noteworthy probability and some progress has already been made.

The carpet and rug industry in normal years, uses 80,000,000 pounds of jute. Paper yarns have been found to be more desirable for Axminster rugs than jute. With good wet strength and pliability to resist the shampooing process which rugs undergo in service, we open up a new post war market of tremendous possibilities.

V Box

The familiar V box is thoroughly representative of the technological advance that can be made under war pressure. This has been a very dramatic development and most of you are familiar with it.

The motivating force in the development of this container was the result of the failure of existing containers and lack of lumber. There were reports from the front of damaged and lost supplies and of much wasted time and effort in the salvaging operation of foodstuffs and other supplies. It was evident that fiber boxes were not performing satisfactorily and that a container of new and improved material was needed; a box far superior to the one that had been used so successfully for years in domestic and export shipping and, superior from the standpoint of strength, stiffness, and durability.

Existing containers were not taking the handling of wartime requirements. In a landing operation, materials cannot be handled with kid gloves, and speed is absolutely necessary. Many of these landing operations are subjected to shell fire and air bombardment. Without dock or lighter facilities, in most cases, containers are thrown into the surf where they may be washed about for 24 or more hours before collection. It is evident that a container which can withstand this treatment must be tough and resistant and retain its shape during subsequent handling.

Had lumber been available, the V box might not have come into being. But lumber was critical and the industry immediately set to work to develop a paperboard container equal in every way to the nail or wire-bound wooden box. After extensive experimentation and field testing, the industry met the challenge and we now have an overseas shipping container having a dry burst test of over 750 pounds and a wet burst of over 500 pounds, after submersion for more than 24 hours. This container has the ability to withstand exceedingly rough handling after submersion. This achievement is an outstanding one and part of its credit must be contributed to the use of urea-formaldehyde resin in conjunction with starch as a waterproof adhesive.

What does this development signify for postwar application? In this case, the war has forced an end result that the container manufacturers have been seeking for years. There has always been a need for a waterproof container to meet the peacetime requirements of the fruit and perishable food industry. A variation of the V box will be used in peacetime to overcome difficult refrigeration conditions at high relative humidity followed by rough handling and shipping conditions. The service has always been met with wood but in the future will be met with paperboard at a lower first cost, lower freight rates, and with safer handling of products. It is a logical development and represents tremendous future possibilities.

There has been quite an extension in the field of impervious paper for food and ordnance wrapping during this war. In the preparation of rations for our Armed Forces, notably dehydrated and powdered foods, we have found new packaging problems. Water vaporproof barriers have been the big stumbling block and the search for papers that meet the exacting requirements is a continuing process. Best results have been obtained with laminated materials utilizing the best functional properties of each material. The components used are strong kraft, cellophane, plassine, metal foil, and elastic plastic films with asphaltic compounds, waxes, thermoplastic resins, and asphalt resin combinations utilizing the most modern techniques of impregnating, coating, and laminating. These developments have led to positive protection against water vapor permeability, light, foreign odors, and insect infestation. The qualities of greaseproofness, flexibility, and waterproofness have been attained. Papers are applied in the form of bags, envelopes, casing box liners, canisters, bag-in-carton, and bag-outside-carton.

Concurrent with the above development, we have seen progress made in the dehydration of foods. Dehydration is an integral part of the war food program and of the postwar feeding problem. Dehydrated foods have been a practical answer to diverse shipping, handling and storage conditions encountered in all parts of the world. What will happen to the expanding dehydration industry and its corollary, the impervious paper packaging angle, after peace comes has aroused considerable speculation. Again, some dehydrated foods will prove to be war babies. Others show considerable promise for the peace and will need paper for packaging.

Dry whole milk as a food shows real postwar possibilities in the way of production and distribution economies. It is a known fact that fluid milk can be produced at lower cost in the corn belt where feed costs are lower. In this area, dry whole milk would solve the problem of perishability and decrease milk cost to consumers in the thickly populated East. This dehydrated product would enable us to carry the flush milk production season over into the short season and help to level seasonal prices. Dry whole milk is also more nutritious than pasteurized fluid milk.

Dry skim milk may become a part of our diet after the war as one of the components of bread. It

improves the bread in many ways and the bakers have a definite liking for it.

One of our important lend-lease foods is dry egg powder. Although this industry is not new, it has expanded during the last two years from 7,000,000 pounds to 235,000,000 pounds and production is increasing. Although this product will be cut after the war, there will undoubtedly be greater relative output than prewar because of the economies that have resulted from volume production.

Dehydrated meats are being used but they seem to offer no immediate commercial future, primarily because of the flavor loss. Our Allies, however, have found dehydrated meat better than no meat at all.

Dehydrated vegetables are subject to considerable conjecture. Potatoes and onions seem to offer some opportunities. Dehydrated soups have consistently shown an excellent record.

Dehydrated foods, like the canned and quick-frozen goods, are being improved constantly and the future will give us improved products, and paper will go along.

Plastics from Pulp and Paper

The paper industry is very closely related to the new plastics industry and that is fortunate because the growth of the latter industry has been phenomenal and, to a large extent, has shown surprising independence of the national economic situation.

Some plastics can be thought of as byproducts of the wood pulp industry. By chemical processing of certain pulps we obtain cellulose nitrate, which makes good gunpowder, and our oldest plastic, celluloid.

Cellulose acetate is also widely used as an alternative for glass, and in the rayon industry it represents a fast-growing synthetic textile. Other chemical compounds of cellulose produce cellophane and viscose rayon.

Additional derived products of cellulose are methyl, ethyl, and benzyn cellulose. Ethyl cellulose is used as a film in packaging and for some applications, in plasticized form, as a substitute for rubber. Methyl cellulose is now receiving some consideration as an extender for critical casein in making certain grades of paper.

Lignin is receiving considerable attention and some application as a plastice material in this war. Lignin is doing an excellent job in a well-known wallboard. Lignin, derived from sulphite pulp waste liquor, is being precipitated on fibers and made into a sheet. These sheets are later molded in laminate form. These laminates are being used for pattern plates, electrical applications and many other purposes.

One large producer of plastic molding compounds, is marketing a general purpose phenolic material employing sulphite waste lignin as an extender for the very critical phenolics. Lignin enriched pulp, replacing wood flour as a filler for plastic molding compounds, is also coming to the fore.

As soon as our chemists are able to define lignin structurally, we will undoubtedly see a much wider application for the material.

There is always something new in the plastics industry. New synthetic resins are being announced at the rate of one a month, and what impact these discoveries will have on paper is unpredictable. The future of the plastics industry after the war, is exceedingly bright and it will have a definite bearing on the paper industry.

In the structural field, the new high-strength paper-base laminates excite the imagination as a functional material. The new low-pressure synthetic resins have accelerated this development. Research and development programs are continuing in the paper industry. The work of the companies and of the Forest Products Laboratory has demonstrated that paper-base sheets from kraft and cotton fibers are as suitable as mitscherlich sulphite pulp for use in high-strength paper laminates.

These laminates are adaptable to some structural and semistructural applications in the airplane. Their physical properties are remarkable and in certain applications they are replacing aluminum. Their rivetless construction possibilities represent lower wind resistance, higher speeds, and fewer parts with lower labor costs. Although the famous DeHaviland Mosquito bomber is a plywood laminate job, it is not difficult to visualize paper-base laminates in a speedier bomber carrying heavier loads.

One should watch this development in the paper industry. There is still much work to be done, and costs must be lowered—but watch it, it may surprise you.

The preformed and molded pulp products have been brought into sharp focus by wartime developments. Instrument and clock cases, flare spacers, walky-talkie battery and flash light cases, helmets of various types, special cups, hand grenades, special shell cases and canisters, are some examples. The use of resins, some noncritical, have helped to meet the specifications for these applications.

I know that the improvements in techniques in this interesting field which the war has spurred, will make for new products in an expanding postwar market. It is of considerable interest to note that a large automobile manufacturer has recently taken out a patent for an automobile body made by the pulp-preforming process.

The natural adhesives which the industry has used so widely—namely, casein, starch and glue—have become very critical. The War Products Development Section of War Production Board is now devoted to the study of substitutes and alternatives to help the industry. Russell Savage of this Section is giving this project much of his time and the Section is hopeful of giving considerable help.

It is my considered judgment that new synthetic resins will ultimately replace in a great degree, many of the natural adhesives. It has been suggested that the paper industry take some lessons from the textile industry in this regard. Textiles have used synthetic resins for years with excellent success.

Lamination

One of the most significant trends that the war has accentuated, is the combining of paper and paperboard with other materials such as steel and plywood, when those materials serve as cores or reinforcing components.

In the fiber can field, we have seen considerable package revision during this war in an attempt to save critical material. In many instances, this revision has been accomplished with paperboard, beaded or edged with steel wherever necessary for additional strength. The war has forced us to learn the techniques necessary to do this job intelligently, and that knowledge will prove beneficial in many peacetime applications. These cans are being made by spiral and convolute winding and by a lap-seaming tech-

nique. The first mentioned is the most versatile. The fiber can has many inherent advantages such as low unit weight, low cost, and suitable strength. It can be made proof against oils, greases, water vapor, water, acids, and alkalies. The war has helped to establish its application for many years. It will maintain its improved status after the war in the packaging world.

Paper-fiber drums have reached a prominent position as a result of new manufacturing methods. They have replaced steel and will continue to do so in the future.

In the realm of plastics laminating we will see decorative paper laminated to low cost cores with a tough wear-resistant synthetic resin suitable for table tops, store counters, and panels. We will see decorative and artistic paper face sheets laminated plastically to steel for safe fire-resistant wall surfaces in homes and other structures and even in the transportation field. One large progressive steel manufacturer has already publicly declared his intention to promote this product. We will also see plywood used similarly in many applications.

Other Developments and Trends

The war has seen a very definite trend toward lighter basis weight papers. Many of those papers will not revert during the peace. That is especially true in fine writing papers. Better opacities are now obtainable through the use of improved pigments and better strengths are to be had by improved pulps and treatment of pulps. Concurrent with the lighter basis weight, there will naturally follow a demand for higher paper machine speed.

Paper is even being used in the manufacture of printing plates. These plates are used in certain duplicating processes and in general offset printing. The technique lends itself to black and white and color printing, not to mention half-tone work. Other papers coated with special plastic chemicals are being used in lithographing printing. This development has conserved significant quantities of zinc and aluminum but it must also be said that its technical advantages predict a significant peacetime application.

There is some development in the application of certain natural fibers due to shortages created by the war. Yucca from Arizona, New Mexico, and Mexico, is being employed as substitute for manila for certain strong papers. Caroa, a leaf fiber from Brazil, is being employed in some insulating papers. We are told that the seed stalks from American hemp that is being grown in Kentucky, Minnesota, and Wisconsin, will also yield some fiber for our industry. Even that old will-of-the-wisp ramie fiber, is again up for discussion and study. Crotolaria grass from South Carolina has been mentioned of late. There are also certain synthetic fiber wastes being used. What the above fibers will mean in the postwar period is a subject of considerable conjecture.

It has been recently announced that the manno galactans will have some technical application in the paper industry. This has been an exceedingly interesting study and one that is related to our problems of formation and adhesives. Commercial applications have been rather limited at this date but they augur much for the future.

One of the large chemical companies has announced a new synthetic sizing material. It is an engine-sizing agent used in conjunction with rosin. The use of from 10 to 50% of this material on the weight of the rosin, makes it possible to get much harder sizing with appreciably less rosin. Alum requirements are not normally affected. The new material is provided as a water dispersion. It can be added to the beater with the rosin size or separately at some other point in the stock system.

It is claimed that, with this material, it is possible to obtain the same degree of engine sizing with as little as 25% as much rosin at a lower cost and often with a substantial increase in sizing at no additional cost.

The small housing field in the postwar era may employ considerably more paper. The following examples are typical of current thinking. Combinations of resin impregnated corrugated board are being suggested as structural entities, incorporating the properties of water resistance, fire retardance, decay resistance, and insulating properties.

In the past few months, an ingenious laminated paperboard has come to the market; it is lined on both sides with asbestos and has been approved as a nonmetallic material by the insurance underwriters for making heating ducts. It has already been installed in some defense plants. It has excellent insulating properties and is light in weight but is limited at present by production facilities. Proposed installations would save metals at the rate of approximately 80,000 tons per year.

Paper is also being considered by the Office of Production Research and Development in the War Production Board, for makers of pressure pipe. With new techniques and new resin materials, this problem is not impossible; and then there is the thought of the "packaged" house completely made of paper.

Phenolic Materials for Wartime Demands*

By Frank W. Vogt[1]

Bearings

In these wartimes when so many metals are being replaced by plastics it is natural that the phenolic laminated materials would be called upon by industry to an increasing extent. Many industries besides the paper mills and steel mills are turning to this material for use as a bearing. The paper and steel mill experience extending over more than a dozen years has served as a guide in making new applications, many of which have worked out so successfully that the water-lubricated-type bearing will no doubt be used in these places permanently.

There are many ways of manufacturing this bearing material. Fundamentally they are similar in that sheets of canvas, belting, or other fabrics are impregnated with resin and molded under heat and pressure. The better wearing properties of some of these have

*Presented at the convention of the American Pulp and Paper Mill Superintendent Association, Hotel Commodore, New York, N. Y., June 15-17, 1943 as part of a panel discussion.

[1]Joseph T. Ryerson & Son, Inc., Jersey City, N. J.

brought in general use the heavy belting fabric especially for such heavy-duty bearings as on calenders, press rolls, beaters, etc. Lower friction and longer life go hand in hand so that a two-fold advantage is gained through its use.

Generally the installation of these phenolic bearings consists of using a liner 3/8 or 1/2 inch thick in much the same way as bronze was previously used. Babbitt bearings are replaced by simply boring out the old holders or housings and inserting the completely machined liners and fastening them in place.

The design of the bearing itself and the arrangement of the water lubrication supply are important considerations in obtaining the best bearing performance. While mill conditions vary greatly, the general principles involved are shown in Figs. 1-4.

Figure 1 shows the top press roll bearing with felt seal rings enclosing the water chamber so that the water will not leak or run off onto the sheet but will be carried away to lubricate the bottom roll bearing.

Figure 2 shows the location of the water supply being adjusted on calender rolls. This is necessary due to the need for more or less cooling depending on the pressure required on the different kinds of paper being produced. The water is restricted by a felt seal ring on the outside and another on the inside with a catch-all and drain to keep the face of the roll dry.

Figure 3 shows a typical beater installation arranged with a water catch-all on the outside to carry the water away to the drain. The bearing liner is shown chamfered to within a short distance of each end to form a pocket for water. This lubricating water may be brought to the bearing by spray pipes with small holes to spread the supply along the full

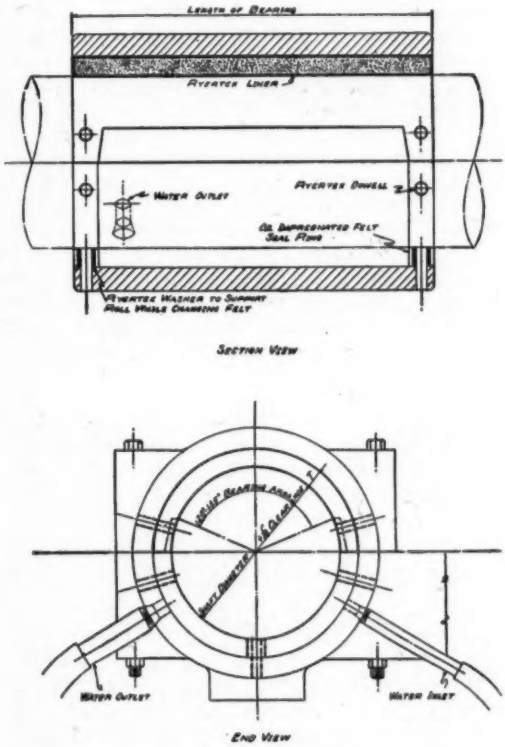

FIG. 1
Top Press Roll Bearings

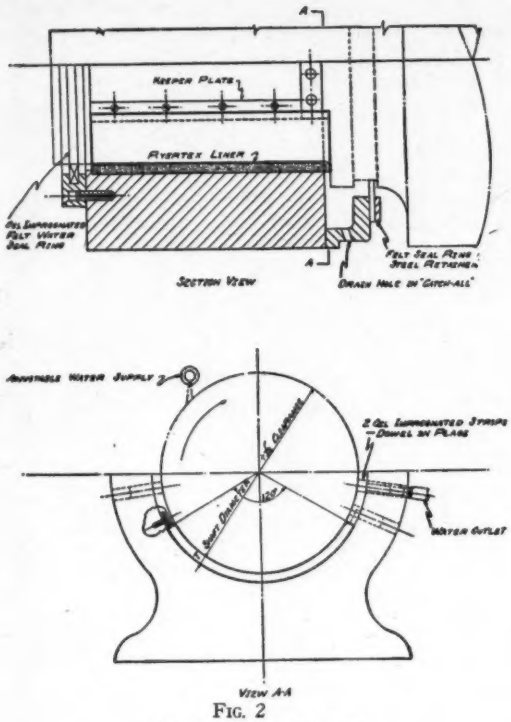

FIG. 2
Calender Roll Bearing Design

length of the journal or by open-end pipes securely fastened in position over the center of the journal or through the housing into the long chamfer as shown.

Figure 4 shows a typical jordan thrust bearing equipped with synthetic molded liners held in position with integral keys. These keys transmit the load to the housing and keep the liners from rotating. The opening between the top and bottom 135° liners should be kept flooded with circulating water. The water should be brought in at the outside end and released over the retainer at the plug end. An arrangement of this kind will not only conserve water but increase bearing life.

Suction box covers made of flat laminated slabs of Ryertex are being found to have many advantages in these days of critical materials. Worthwhile savings can be effected on one of the tightest materials used by the paper mills today, namely, fourdrinier wires. Increased wire life of 10% to 150% when translated into pounds of conserved high-quality bronze wire becomes an important consideration.

The advantages as reported by a group of mills recently contacted in a brief survey indicate that this type cover is really doing a good job in assisting the manpower problem in addition to the material supply problem. A summary of some data illustrating these facts are given below.

Mill	*Previous*	*Now*	*Wire Life Increase*
a.	45 days	70 to 84	55% to 86%
b.	400,000 lb.	1,000,000 lb.	150%
c.	———	———	10% to 20%
d.	———	———	20%
e.	4 weeks	6 to 8 wks.	50% to 100%
f.	———	———	10%
g.	———	———	Increased
h.	———	———	Improved
i.	———	———	10% to 20%

Supplementary advantages as reported by these same mills are

	No. Mills Reporting
1. Increased production by running 25% faster.	1
2. Reduced vacuum.	1
3. No accidents due to knots, slivers, etc.	2
4. No sticking of wires.	1
5. More production because fewer shutdowns.	6
6. More uniform sheet due to slotted design.	4

These mills were considered representative of an estimated one hundred or more mills using this material for covers. Our records indicate that less than 5% of users have failed to increase wire life, most of these being mills using incorrectly designed covers or wrong grade of materials.

Doctor blades, now long in use on press rolls, etc., are continuing to be used to advantage in the industry. Some mills are doing a good job with them on creping doctors, others on felts and some on calenders. Improvements in material have assisted greatly in making some of these installations particularly successful.

Bad Water Conditions and Remedies

Some mills have water conditions which cause a certain amount of corrosive action to take place on roll journals in addition to many other metal parts. When Ryertex bearings are used under such conditions much of the etching or pitting effect of the water is prevented by applying a small amount of grease in addition to the water. This is usually possible on such important bearings as bottom calender rolls and press rolls, which in most mills are simply lubricated with water only.

In further reference to water conditions it will be of interest to many to know that it is possible to obtain bearings that contain finely divided particles of mineral polishing agents. These are thoroughly and evenly distributed in the body of the fabric of the bearing so that they are in contact with the journal during the entire life of the bearing. The effect of this type material is to polish or constantly overcome any etching effect of the corrosive water. The result is that the bearing lasts longer and has a lower coefficient of friction.

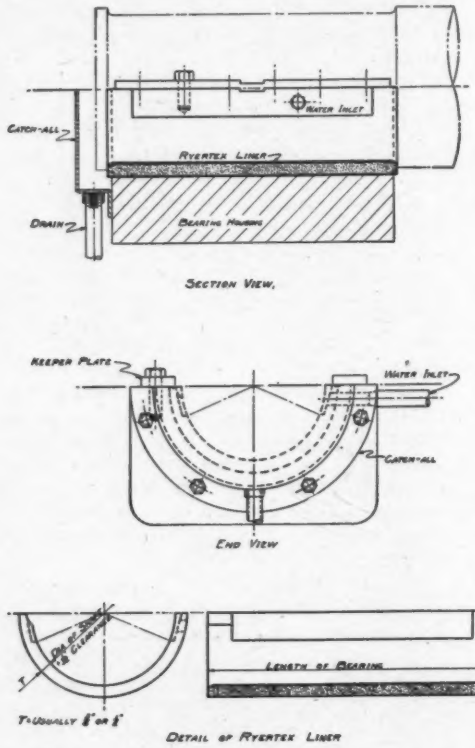

FIG. 3
Beater Bearing

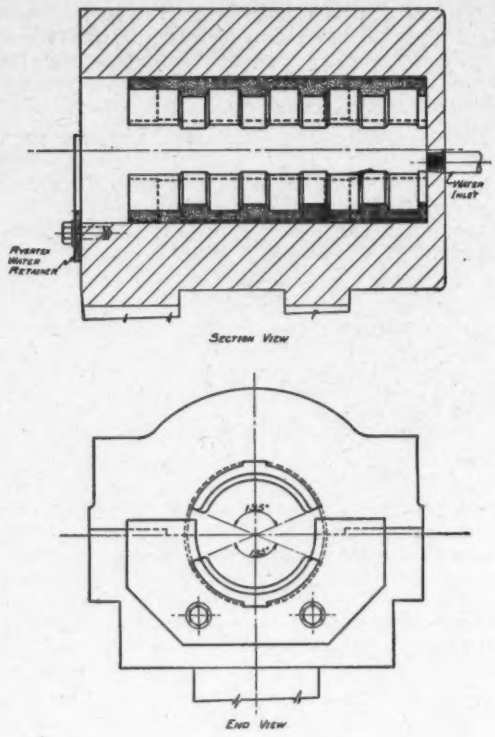

FIG. 4
Jordan Bearing for Thrust End

An observation in connection with the effect of different kinds of mill water is that slime accumulation does not adhere to Ryertex like it does to brass. This has been noticeable on cylinder rods and screen plates. Cylinder rods are not affected by corrosive mill water and do not pick up the slime which causes many board mill cylinders to get out of balance. Screen plates with small drilled holes are being found very easy to clean with a stream of water such as is ordinarily used in washing down the machines.

Long Bearing Life

Bearings operating in wet places or where water can conveniently be used instead of grease or oil are the ones where the Ryertex-type material will out perform metallic bearings. In such places bearing life has been increased as much as ten times. This makes a big difference on presses and calenders where keeping rolls in line is important from an operating point of view.

Simplifies Problem of Cleanliness

Cleanliness is enhanced through the elimination of oil and grease on bearings which are normally hard to keep properly lubricated. The ability of laminated plastic bearings to operate here on water simplifies this problem as well as that of keeping dirt and grease out of the paper stock itself.

Materials Handling in Pulp and Paper Plants*

By E. Southworth[1]

Abstract

Progress occurs because someone sees a need and studies a situation until a better way is found. Improved methods and equipment are engineered to the job by survey, study, and analysis. With equipment hard to get and often unobtainable, even more must we depend on surveys and analyses of methods to get more productive work from existing facilities. One of the functions of mill operation that is causing exceptional difficulties today is the handling of materials. This paper is concerned with suggesting what surveys of handling operations can contribute to solving or alleviating today's problems.

From your standpoint, pulp, paper, and paper products are raw materials or finished products plus scrap which again becomes raw material. To the maker of equipment for handling them, they are materials in bales, rolls, sheets or packages weighing roughly from 400 pounds per unit to 3-tons; and in size from 30 by 30 by 18 inches to 4 by 4 by 6 feet. They are produced or used up or shipped out at rates of tens to hundreds of tons per day. They are stored in thousand-ton lots, shipped and received in 10 to 50-ton loads and moved to and from processing operations in heavy units. They are produced and consumed by intricate automatic continuous process machinery that must be reliably and rapidly served.

Loading and unloading box cars, trucks, and even ships, stacking in warehouses, delivery to beaters and pulpers, moving products between processes in the finishing room, weighing, storing, and again loading for outbound shipment are the jobs of the handling function, each with its own individual requirements as to capacity, dimensions, and individual capability of the equipment. All the while the pace is set by vast, complex machines operated by highly trained men of great skill.

The handling job is, therefore, a challenging one to the maker of equipment and it is vital to you. Movement of goods is commonplace when it goes smoothly. Stoppage or delay is next door to catastrophe. That perhaps, is why the subject of materials handling assumes so great an importance when its smooth operation is interfered with.

We all know the problems of labor shortages and unavailability of important equipment so intimately that a review of causes would be more painful than revealing. What to do about it is the important thing. Let's approach that by reviewing the jobs that industrial trucks are doing, which by the way, is a pretty good forecast of what they can do when they can again be furnished in the amounts needed. Then, we can proceed to considering what we can do to make the best use of those we have. After that, we can consider what steps can be taken to save time and manpower with other existing equipment where no industrial trucks are available.

Materials Handling

The handling of pulp in laps or bales is the first operation where the industrial truck is commonly found. Loads are placed on skids or pallets, often of special design.

Figure 1 shows a high-lift fork truck stacking skid loads of twelve 400-pound bales in storage. Note the strips on the deck of the skid which permit rapid removal of ¼ or ½ the load by fork truck or crane sling in car and shipploading operations as shown in Fig. 2.

The 16-bale 6400-pound load in Fig. 3 is moved up a 15% grade to carloading dock and a 150-foot round trip is completed in 3 minutes. The Towmotor easily moves 150 to 175-tons per 8-hours from warehouse to car door, and when loading ships, moves it over 250-foot hauls at a rate of 140-tons an hour for an 8-hour day. Overall cost has worked out to about 4c a ton.

Small trucks are best used for carloading operations, leaving trucks with high lifts free for storage jobs. An 8½ by 40-foot box car can be loaded with 200 to 250-bales totalling 40 to 50 tons in from 2 to 3 hours. It is sometimes advisable to employ a helper to pry or hold bales in exact position, if tight even stowing is necessary.

Incoming pulp at the paper mill is unloaded, stored, and later delivered to beater room by the same method. One Towmotor can unload 100 to 150-tons per day and deliver the required tonnage from storage to beater room.

Two-fork trucks received incoming waste paper bales, 1000-pounds to 1500-pounds each, and handle them through unloading, weighing, transporting, and stacking at the rate of one carload per hour, or a total of 250 to 300-tons per 24-hours. Two helpers are used to weigh and tag bales. With hand trucks, one car used to require 3 to 4 hours for 6 or 7 men.

The experience of paper convertors and collectors of waste paper may be interesting to those who have to handle bales of waste paper as incoming raw material. One Towmotor can load 14 to 16 bales (average weight of 1300 pounds) on a highway truck in 15 minutes or load 25 to 30 bales in a box car in 40 minutes saving the work of 3 or 4 men. Each trip from warehouse to car and back requires 35 to 40 seconds.

In the finishing room, a still wider variety of weight, shapes, and sizes is encountered, and possible routes of material flow are more numerous. Space is limited between the operations of cutting to size, inspecting, counting, weighing, and packing, and hand-powered equipment such as two- and four-wheel trucks, hand-lift trucks and skid platforms or pallets are best adapted to the requireemnts. Loads under 1000 pounds and to be moved only 10 or 20 feet are generally best moved by hand, especially where there

* Presented at the meeting of the American Pulp and Paper Mill Superintendents' Association, Hotel Commodore, New York, N. Y.
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is no need for stacking, and where the chief use of handling equipment is to hold the material before a production operation and accumulate it afterwards.

Where stock is finally assembled for final packing and storage or shipping, the fork truck is again necessary in handling of steel-strapped skid loads weighing 2800-pounds. Such loads are moved from storage, weighed, and placed in car or truck in 1½ to 2 minutes. Loading a highway truck with 6 skids totalling 21,000-pounds was completed in exactly 10 minutes by stop-watch tests. One Towmotor takes care of 140-tons per day.

Four cases of book paper measuring 3 by 4 by 14 inches and weighing 600-lbs each were carried 275 feet to storage and set in place in 1 minute, 48 seconds, the return trip requiring 1 minute, 15 seconds. This rate approximates 50 tons per hour. Where there are extra high stacking requirements or need for exact placing in cars or trucks, the rate of work would be reduced to 20 or 25 tons per hour.

Finished stock in roll form is generally simpler to handle because of less variation in sizes, shapes, and grades and because average unit loads are bigger. That is why industrial trucks have been so valuable and so generally used for handling newsprint, kraft, chip, and strawboard. In general, the same rates of one truck to effective handling of 100 to 150 tons per day appears to be maintained. On straight conveying jobs where no stacking is required and where distances range from 100 to 150 feet, 1500- to 2000-pound rolls can be handled at a rate of 45 to 50-tons per hour.

In general, it appears from a recapitulation of figures from a number of sources, operating under widely different conditions, that an average of 100 to 150 tons in eight hours per fork truck is a conservative basis on which to plan.

This rate seems to apply about equally to receiving and shipping operations as long as load units range

FIG. 1
Tiering 12-Bale Skid Loads of Sulphite Pulp.

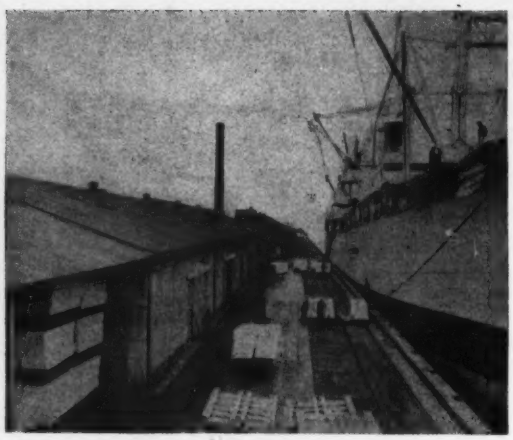

FIG. 2
Loading Sulphite Pulp Aboard Ship at Western Mill.

from a ton to three tons and the volume is such that the job is reasonably continuous.

Since it is our purpose to see what can be done to make existing equipment go further, it is well to investigate the point suggested by the fact that many time studies of individual jobs where there are short hauls and a relatively low height of stacking, indicate that 30 to 50 tons an hour is a reasonable figure. Apparently, it is almost never necessary for an industrial truck to keep working full time, because we seldom find a mill where a truck is not idle for some considerable period at various times of the day. Undoubtedly, under most operating schedules it is necessary to have this extra capacity in order to allow for tie-ups and to allow time for assistance with millwright jobs and other incidental types of work. We believe, however, that in present times more careful planning of time schedules, more thorough arrangement of warehouse space, and more fully planned schedules for delivery of material from storage to beater room, or perhaps from finishing room to storage or shipping will help to utilize truck time more completely.

It can be pretty safely taken for granted that if industrial truck equipment is not in full use at all times, there must be some way to get from it the extra hours work that are needed. This does not necessarily mean that a truck which is not working full time is not paying for itself or saving manpower, but it does mean that as long as there is an additional need to save manpower every idle period of the industrial truck or any other piece of equipment should be observed carefully with a view to finding out how that time can be applied to reducing time, manpower, and cost requirements on other jobs. Oftentimes, it may be quite simple to trade equipment back and forth between departments which have hitherto operated as quite separate units. In fact, it is generally our experience that department Foremen are charged with the responsibility for scheduling the handling of materials, and perhaps it might be advisable to start with the premise that some one individual should be placed in general charge of all handling functions throughout the mill.

Since power truck equipment is scarce today and generally almost impossible to obtain, the implication just discussed regarding making full use of existing trucks is of prime importance. The point previously

discussed concerning keeping trucks on the job and hard at work full time, is only one of a number of elements. In fact, equally important do we consider making sure that the most work is accomplished for every minute's use to which the truck is put. Next to that, comes the question of making sure that the truck is kept in good condition so that it will stay reliably on the job and work at full speed and minimum cost.

It may sound commonplace to say "follow the materials around", but I venture to say you will find some new things almost every trip you make. It may be simply a slight rearrangeemnt of aisleways, or discovery that stock could be piled two-high where it is now covering a lot of floor space and producing a cramped condition. You may find that a new loading dock or perhaps another foot added to the width of the old one will save a great deal of time in loading trucks. You may discover that the bridge plates leading into box cars are too narrow to permit trucks with big bulky loads to run in at an angle and thus save a lot of maneuvering to get the load into the end of the car. Simple repairs to floors will speed the operation of power trucks and hand operated equipment, too. They increase safety to workers and to loads. Clear making of aisleways and storage areas keeps the road clear for rapid movement of goods and simplifies planning and instructions.

Maybe a ramp could be constructed to advantage, or an existing ramp could be modified slightly to increase safety and speed of operation. You will find instances where your power trucks are being used to handle relatively light loads in relatively small volumes while the travel of much bigger loads over longer distances is delayed.

The hand-lift truck for pallets (Fig. 4) is a valuable supplement to fork truck operations, for it permits pallet loads to be moved short distances by manpower. It relieves the fork truck of the necessity for waiting to move loaded pallets out of the way at loading points or for being on hand to place them exactly at unloading points. A hand lift pallet truck in the packing section of the finishing room allows loaded pallets to be moved a few feet away from the work place where they can be accumulated for quick movement by fork truck over the long hauls. That is just one of the ways you may possibly find to keep your fork trucks busy all the time if you survey each department and each operation from the material handling standpoint.

FIG. 3
Sixteen 400-lb. Bales of Sulphite Pulp on 15% Grade to Car Dock.

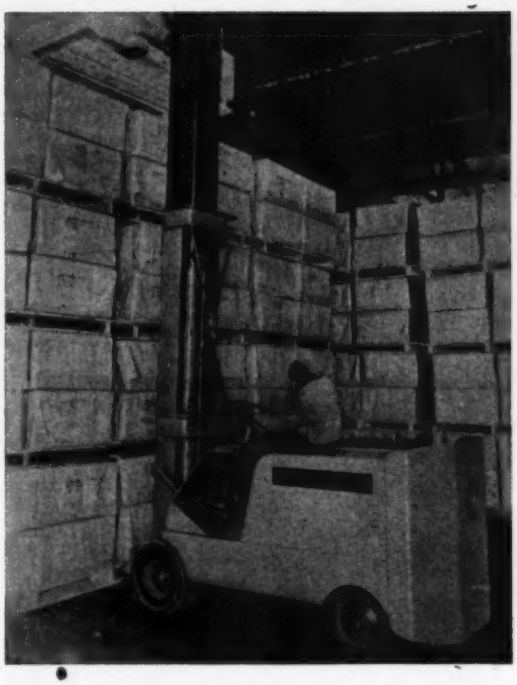

FIG. 4
8-Bale Pallet Loads Stored at Southern Terminal.

Repair, reconstruction, or redesign of skids and pallets and similar work carriers helps in two ways. First, is the saving of time and energy for production workers by use of load carriers that can be filled at work table height or from which machines can be fed without reaching, stooping, or bending. Second is the increased ease with which properly designed racks and skids can be moved between processes by power or hand-operated units. Sometimes racks can be built for quick easy stacking, or again a slight change in dimensions of skids or pallets permits full loading and adaptability to spaces hitherto unused for temporary storage. Quite often we see large skids only partly filled or small skids or pallets over-filled.

Where space is at a premium it is, however, better to err on the side of having work carriers too small because it is easier to combine a number of small loads of the same kind than it is to group several different kinds of stock on one large carrier. The minimum limit on size should be the size of the smallest stock which occurs in any considerable volume.

Where picking up, placing and stacking operations monopolize the time of the power truck, plan to set pallet loads on 4-wheel trailers for the long hauls and let the truck tow a number at once. It can quickly unload them at the end of the run and the time of the single trip can often show a big saving over the time that would be consumed on 3 or 4 separate trips.

Manpower Problems

Urge your truck operators to be alert for improvements and to suggest ways of doing more. They may be able to point out new ways of arranging storage areas for greater accessibility, faster ways of loading or unloading cars or trucks, or faster, safer ways of loading containers and stacking them. For instance,

in stacking bales of pulp it is much easier and faster to set dunnage strips on top of the load *before* stacking than it is to climb up on the pile and set them there after stacking and before the next load is ready to be set in place. Those are the kinds of things operators find out. Don't give us any credit for being smart—we simply learn what smart users tell us, so we pass the suggestion along. If we can find some paper for it, we are going to print a Fork Truck Operators Instruction Guide which embodies a lot of these suggestions in pictorial and check list form.

A materials handling tour of your mill, department by department, will show where the heavy tonnage is moved, where congestion is apt to occur and whether or not that congestion is the fault of the materials handling equipment or of some piece of production machinery that may constitute a bottleneck.

The foregoing suggestions are based largely on the assumption that some industrial power trucks are in use. To those who do not have them, we say that overall planning for use of hand lifts, two, and four-wheeled hand trucks or trailers, overhead and roller conveyors, cnain hoists and cranes is important. In fact, the more different types are used and the more manpower is required in their operation, the more necessary the coordination becomes.

The investment involved in a crane or power truck is an incentive to planning for full use of it, and hand-powered equipment is comparatively neglected in planning. A well-planned system for hand-operated equipment brings the same relative advantages of full utilization of equipment and saving of manpower as does planning for the fully mechanized type. Furthermore, the knowledge such systematizing gives of production rates and man-hour requirements for handling materials in accordance with those rates, permits complete planning for and speedy installation of a mechanical system as soon as equipment is available.

By such planning, it is possible to find where an elevating mechanism, for instance, can cut man-time and effort in stacking or in lifting to elevated loading docks. It is possible to find that a chain hoist or a section of conveyor can do more at some other location. Perhaps fewer hand-lift trucks can be used in one department without serious burden, permitting other departments to operate to better advantage.

Analysis of handling operations may reveal that a few more four-wheel trucks would reduce the number of man trips to deliver bales from storage to beaters and that ability to leave loaded 4-wheelers in the beater room would avoid re-handling of individual bales there. Likewise, more 4-wheel trucks in the finishing room would permit large load units to be easily pushed aside out of the way by packers or inspectors until the loading gang can find time to get them without interrupting other work. Generally, one lifting operation can be eliminated since it is usually as easy to build a load on a 4-wheel truck as it is to pile it on the floor.

Slight revisions of method in stacking bales and rolls with portable elevators may account for considerable savings in manpower. In this case close observation of the operation is essential, because the choice is between moving the material or the equipment. You may find that time is being lost because portable elevators are moved too frequently in order to keep them close to bales being stacked or unstacked. A simple check of time required will tell whether it is better to move the bales a little farther on the average than to interrupt the work often to move the portable elevator. If the floor is good and the elevator can be moved easily, keep it close to the work. If it's hard to move because of floor or other conditions and men have to climb down from the pile to help push it, don't move it so often and plan to move the bales farther. In general, follow the principle of using manpower and man-time to move material rather than equipment.

Our Service Department has a saying "some minutes are worth hours and dollars" and that is very literally true. A little time spent in checking over performance and making routine adjustments of equipment is well repaid. Trade publications have done an outstanding job of collecting and presenting maintenance know-how, and equipment makers have check-charts and instructions that every maintenance supervisor can use. All these data are so good that it is only necessary here to repeat the reminder to inspect and adjust and lubricate handling equipment on the same regular basis as production machinery.

Hand-powered equipment especially should be kept in easy running condition because that permits it to be operated with minimum man-effort. Equally important is good condition of floors over which manpower moves materials. Even casual observation will point out such drains on manpower and time *if you are looking for the situations that cause them.*

Conclusions

If workmen are still seen to be struggling with loads even after floors and equipment have been put in good shape, try reducing loads by getting more skids and trucks so you can handle smaller loads. At the same time you may find you are benefitting by ability to better arrange work and storage areas.

A few general rules may help in surveying and planning:

1. Make long hauls on big wheels—4-wheel trucks are most generally equipped with 6- or 8-inch wheels and are well-adapted to long hauls.
2. Use mechanical lifts at storage points.
3. "A" frames or portable cranes fitted with chain hoists or block and tackle can be readily spotted in cars or at stacking points in storage areas, while jib cranes can be used at scales or beaters to avoid heavy tugging and lifting.
4. Upending racks, portable elevators, hydraulic or air lifts, or hoists can be relocated strategically at machines or loading or unloading or storage points to keep them busy at the work they do best.

A simple list of things to bear in mind may serve to tie together the suggestions that I have made:

1. Centralize responsibility and authority for the materials handling function.
2. Follow the materials.
3. Plan all handling operations carefully.
4. Shift equipment where each type can be fully utilized on the jobs for which it is best fitted.
5. Keep all handling equipment in good order.
6. Recheck the system from time to time, for new improvements will constantly be suggested.

As a final recommendation, think of materials handling as a mill operating function in its own right, and check each phase of it for results just as carefully as any production process. You will find that problems are simplified and that new possibilities are made apparent.

Power Plant Operation and Maintenance*

By G. H. Suhs[1]

Abstract

The problem of the power plant engineer under our present wartime conditions is to carry his greatly increased load with existing equipment. He is handicapped as to time and material for proper maintenance, because few industrial organizations have been fortunate or sufficiently farsighted enough to have any great reserve in the power house.

Each engineer must work out his own problems, for few manufacturing establishments duplicate power or process requirements.

A major problem will be in the boiler room and particularly in boilers and furnaces. Fuel troubles are certain to develop at higher ratings.

Power house efficiencies must be sacrificed to production tonnage.

The power plant engineer frequently is in as isolated a position as is a marine engineer in his ship at sea. He must "keep going" with immediately available materials and supplies.

The engineer should have the necessary authority to require the production schedule be arranged to permit regular inspection and maintenance of the power plant —for if the power plant fails there will be no production.

The most satisfactory survey of the present situation in our power plants as regards maintenance and operation is contained in an "ad" by the Foster Wheeler Corp., from which I will quote.

Steam Production vs. Maintenance

"Steam and yet more steam for production has been the vexing problem for two long years. Installation of new power plant equipment has been negligible—shortage of material prevented it.

"One solution remains, the harder driving of existing equipment without outage for repairs. It is to the everlasting credit of Power Maintenance crews that plant shutdowns for lack of steam have been virtually unknown.

"Much of the nation's steam generating equipment is old; it is driven at a higher rate than it was designed for, with the result that greater maintenance and longer shutdowns are inevitable.

"How then to insure maximum production?

"The answer is *preventive maintenance.*

"Plan carefully, inspect continuously, take every possible stitch in time."

That short article completely and concisely covers the problem of power.

Management's Misunderstanding

In reading this through it is probable that the first point which will strike the operating man is "inspect?" The question then immediately arises, how and when? With pulp and paper mills operating 24 hours per day and six or seven days per week, time for inspection is not readily available. It is unfortunate but true that the paper machines can go down at regular intervals for washup, wire change, and felt change, but if an effort is made by the power end to get a shutdown for inspection of its equipment, there is an immediate disturbance at the head office that can be heard the length and breadth of the land! In all too many cases the management feels that by some mysterious inner sense, the power engineer should be able to determine, wihout actual inspection, just when some equipment will fail, and then, by more mysterious means, prevent the failure!

It is today very much the job of the power man to sell the management on the need for regular inspection. The insurance underwriters and the state inspectors will prove of valuable aid on this. In some cases they have taken the issue in hand and insisted on proper inspection on penalty of insurance cancellation.

The inspection report and analysis is the basis of any maintenance program. In case of progressive failure the probable ultimate life can be estimated and repairs made before actual failure causing serious lost time.

W. P. B. Inequities

This is not so simple as it sounds, however. Present War Production Board orders under CMP have placed any power plant with a good operating record very much "on the spot." CMP Regulations No. 5 and No. 5A issued May 1, restrict "maintenance, repair or operating supplies during any calendar quarter to ¼ of the aggregate expenditures for the same for the calendar year of 1942." If, during the previous year or years, the operator has been careful and his load has been normal and he has had no failures and used *no* replacement boiler or superheater tubes, he has no back log record which permits buying new tubes. Nor is he permitted to buy in anticipation of failure. He cannot buy for an emergency until an actual failure has occurred, for according to present definitions the emergency exists only after complete failure which cause shutdown and stopping of production. Matters of this character should be referred to the Industry Division of W.L.B., either local or at Washington, D. C.

It might be well to mention at this point that in the prewar period, many alert organizations insured themselves, in part, against lost production due to equipment failure by carrying "use and occupancy insurance" on such vital units as main turbines, generators, and boilers. Such insurance is of doubtful value during war conditions. Replacement parts and special labor simply are not available, and it is questionable if the insurance companies could be held liable for time lost because of the impact of the war program on such matters.

The sensible and the patriotic program is to inspect and repair—not operate to destruction.

There is little need to impress on any good operator that the heavy overloading of equipment for extended periods will materially shorten its life. This holds on boilers, generators, motors, transformers, and power lines.

It is frequently necessary to impress this fact on the nontechnical members of the management.

Proper operation of the power plant is assumed as "must." No explanation of this is necessary.

Every power plant has certain characteristics, bad

* Presented at the convention of the American Pulp and Paper Mill Superintendents Association, Hotel Commodore, New York, N. Y., June 15-17, 1943, as part of a panel discussion.

conditions, limitations, and faults. The repair and maintenance program must meet certain conditions. There is no grand generalization on either an operating or repair program that can present much of value that the normally alert and progressive operator does not appreciate.

Probably the most valuable contribution along these lines at this meeting will be for various operators to discuss some of their troubles and remedies. Anyone can operate when there are no troubles.

The writer will inaugurate this phase of our meeting by covering some highlights of his experiences "shooting trouble."

Our present power plant was completed in 1928 and it was modern for the times. It contains three boilers with partial water walls, economizers, and air heater. Firing equipment is powdered coal. Steam conditions are 400 pounds at 750° F. Two 6250 KVA extraction turbogenerators furnish process steam and power.

Initial design assumed 35,000 pounds steam per hour as normal load per boiler with a peak capacity of 50,000 pounds per hour. The total yearly coal consumption was to be 25,000 tons of coal and production of paper about 30,000 tons. In 1938 we burned 39,000 tons of coal and made 40,000 tons of paper. In 1941 we burned 55,500 tons of coal and made 64,000 tons of paper. During this period the boilers were normally operated at 60,000 to 70,000 pounds steam per hour and carried peak loads of 80,000 pounds per hour, and 80,000 pounds steam per hour from a 569 hp. boiler is a good rating.

This increase in capacity was not secured without encountering many difficulties which necessarily had to be eliminated to permit good operation.

The first major trouble was excessive furnace slagging due to higher temperatures from operating at higher ratings. When these units were installed powdered coal firing was in its infancy and one school of thought held that a "cold" furnace would kill or retard ignition. The water-wall blocks in these furnaces were refractory faced to assist combustion and remove any hazard as regarded ignition.

At high operating rates the slag would adhere to these blocks and retard heat conduction to the water-wall tubes and, as a direct consequence, tend to increase furnace temperatures which in turn caused more slag formation. At times the slag on sidewalls built up to 10 and 12 inches thick and when a boiler was taken off the line, huge slabs of the slag of this thickness and 8 or 10 feet square dropped on edge to the furnace bottom. It is an excellent attest to the soundness of the furnace design that the furnace bottom tubes took this punishment without any failure. This build-up would occur in about two weeks time.

The trouble was partly corrected by replacing the refractory faced blocks with bare blocks. However, the furnace volume is too small for good operation at the high rating without a shutdown at least once in three weeks.

In 1940 additional trouble showed up in the superheater and tubes began to burn out with disgusting regularity. We did not feel secure for even one week. A careful survey, made with the assistance of our insurance underwriters, indicated the tubes had reached the end of their normal life, as the metal was badly fire checked and burned.

We had no trouble convincing the management of the need of completely renewing all tubes most directly exposed to the hottest furnace gases. They were a bit bewildered, however, at the idea of failures in a new (12 years old) boiler room.

Superheater troubles seemed eliminated for during the high production period of 1941 we operated nearly to full capacity every day at extremely heavy load conditions.

However, we are already proving that these heavy operating loads reduce the life of equipment for in February of this year, we began again to have superheater tubes burn out. This is an interval of but three years since renewal. An examination showed metal failure due to overheating. This can be readily understood for an analysis will show that to add 250°F. temperature to 70,000 or 80,000 pounds of steam per hour with a given area of superheater will call for considerably higher metal temperatures than will be required to heat 40,000 or 50,000 pounds per hour. We have attempted to help ourselves to some extent by changing the boiler baffles so as to reduce the superheat about 50°F. Other than that, for the present, we can only inspect and replace tubes—as long as we can get them.

A definite cure would be alloy steel tubes—for we have experimented with them. But they are not now available.

The higher boiler ratings discussed naturally called for more fuel. The original pulverizers lacked capacity with normal fuels available. Grindability is, of course, a major factor in pulverizer capacity. We found it necessary to change to premium coals having a grindability of 90 to 100, Hardgrove scale. Our older coals had a grindability of about 50.

The semibituminous or Pocahontas coal have the necessary grindability but reference to the records of National Bituminous Coal Commission for District No. 7 will show that amazingly few of these coals have good ash fusion. Very few show a fusion above 2500°F. and our furnace temperatures reach 2950°F. at top ratings.

This has restricted us to a very few coals and we pay a definite premium, but we maintain full production which is the real answer.

We assisted our pulverizer operation materially by rebuilding and increasing the capacity. We added about 20% to the cylindrical drum and increased the number of balls. No trouble has been encountered with the driving mechanism.

Combustion control and pulverizer operation was improved by changing the exhauster fan drive and the feed control. The original drive was steam turbine with throttle, not governor, under control of combustion system. With this control the turbine operation did not synchronize with the other elements, due to lag in arriving at top or bottom speed. Fuel feed was erratic as a result. The turbines were removed and constant-speed motors installed, and the combustion control was connected to operate a damper in the exhauster fan discharge. This has proved satisfactory.

The difficulties in securing replacements on special articles, such as steel valves, regulators, pump parts, etc., are too well understood to require elaboration. But here again *inspection and repair* extend the life greatly. And maintenance costs will drop.

We will mention as a matter of interest that the maintenance of this plant under the original relatively light-load conditions was estimated at $30,000.00 per year. This figure has average $33,000.00 annually over the past three years which we believe speaks well for a regular inspection and repair program, considering the fact that the load has more than doubled on the same equipment.

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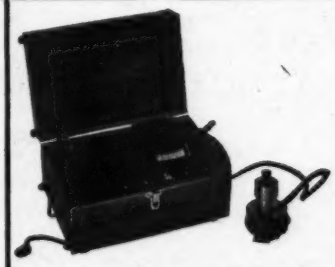

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New York Paper and Pulp Market Review

Threat of Future Paper Shortage is Serious as WPB Reports 26% Decline in Receipts of Wood and Lower Mill Inventories of Pulp — Colored Cotton Cuttings Active — Paper Stock is Strong.

Office of the PAPER TRADE JOURNAL.
Wednesday, June 30, 1943.

Continued heavy demand for paper and many paper products is increasing backlog orders to an unwelcome extent, according to some of the reports received from many manufactourers' representatives, jobbers, and general paper merchants this week.

Although the cutting of more pulpwood to relieve the now serious threat of a future paper shortage, appears imperative, the government agencies have as yet released no favorable statements on the situation. A substantial cut of about 25% in the over-all production of paper is likely, according to opinion expressed in some quarters of the industry.

The index of general business activity for the week ended June 19 rose to 141.1, from 140.8 for the previous week, compared with 130.0 for the corresponding week last year. The index of paper board production was 146.0, compared with 156.5 for the previous week, and with 120.5 for the corresponding week last year.

Paper production for the week ended June 19 was estimated at 87.5%, compared with 86.9% for 1942, with 99.9% for 1941, with 93.1% for 1940, and with 79.2% for the corresponding week for 1939.

Paper board production for the week ended June 19 was 95.0%, compared with 69.0% for 1942, with 88.0% for 1941, with 79.0% for 1940, and with 66.0% for the corresponding week for 1939.

Wood Pulp

The War Production Board reports under date of June 28 that production of wood pulp is inadequate to meet current needs. Receipts of pulpwood are averaging 26% less than last year, and pulp inventories are decreasing at the rate of 34,000 tons monthly. The WPB states that the consumption of pulp for the first five months of 1943, averaged 862,000 tons a month, compared to a new supply averaging only 828,000 tons monthly.

Under existing conditions, the WPB continues, it is necessary for all consumers to restrict their use of wood pulp, particularly of the scarcer grades, to the production of essential items of paper and paper board.

The decline in wood pulp inventories at U. S. mills, January 1, 1943 to May 31, 1943, as reported by the WPB is as follows: total decline, all grades, 33.5%; bleached sulphite, 16.8%; strong unbleached sulphite and news-grade, 24.1%; northern bleached sulphate, 44.3%; southern bleached sulphate, 2.7%; northern and southern unbleached sulphate, 55.4%; soda, 16.2%. Groundwood increased 23.5%.

Rags

Mill buying of new colored cotton cuttings continues active at ceiling prices. Demand for new whites is a little improved this week, but is slow in comparison to the active trading in colored cuttings.

Old Rope and Bagging

Mill buying of old No. 1 Manila rope is active at ceiling prices. Demand is also active for all grades of fibers. This market continues to reflect a strong one, as the situation of limited supplies prevails.

No important change in the very limited trading in old bagging has been reported this week.

Old Waste Paper

Mill buying of old waste paper is active. This market is strong under a heavy demand for all grades of paper stock. Ceiling prices are firmly maintained.

Twine

Demand for twine and cordage for war uses continues heavy. Civilian uses, limited largely to sisal and cotton fibers, continue to absorb a good volume and prices are firm.

Urges Plan for More Pulpwood

Additional steps must be taken to relieve the impending shortage of paper by increasing the supply of pulpwood. According to E. W. Tinker, executive secretary of the American Paper and Pulp Association, the classification of pulpwood as essential by the War Manpower Commission, may help, but shortage can be avoided by the employment of only 20,000 men to harvest pulpwood. This would be an insignificant sacrifice to the war effort. Mr. Tinker recommended the following steps be taken:

1. All employment offices should encourage woods workers to remain on the job and those who have left for other activities to return to their original environment.

2. A definite campaign to cure absenteeism should be initiated, and the strongest pressure brought upon woods workers to follow the patterns set by their brothers in direct war industries in staying on the job and looking upon their efforts as a contribution toward winning the war.

3. Every available source of manpower, including prisoners of war, internees, relocation camps and imported labor should be utilized.

4. The maximum production of pulpwood by farmers should be encouraged through the use of existing facilities.

Mr. Tinker said that if the declaration of the War Manpower Commission that pulpwood cutting is essential does not result in the early return of all available labor to the woods and if the suggested steps are not taken, "there will exist in the year 1944 a shortage the effect of which is not yet realized by the public."

"These shortages will be felt in the fields of sanitation, information and education, packaging, records and communications," he declared. "The effect of severe shortages in any one or all of these items, which now appear almost inevitable, upon our war economy would be exceedingly bad, particularly because they still are avoidable. I believe that the situation is thoroughly understood in the War Production Board and expect that remedial action will be taken."

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Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, June 30, 1943.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; and powder is offered at $60 per ton, f.o.b., works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Current demand reported heavy. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b., shipping point.

CAUSTIC SODA—Prices on caustic soda are reported unchanged. Demand for the current week is reported steady. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Prices firm. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are lower for the current week. "G" gum rosin is currently quoted at $3.46 per 100 pounds in barrels, Savannah. "FF" wood rosin is currently quoted at $3.45 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is currently quoted at $3.66 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported light for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand active. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are unchanged for the current week. Supply situation tight. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Supply more limited for the current week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	*$54.00	@	—
Sheets	62.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Car load Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.60	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. LL Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00		
Unbl. Softwood Sulphite	65.00	@	66.00
Bl. Hardwood Sulphite	73.50		
Unbl. Hardwood Sulphite	63.50		
Bl. Mitscherlich	81.00		
Unbl. Mitscherlich	72.00		
N. Bleached Sulphate	86.00		
S. Bleached Sulphate	79.00		
N. Semi-Bleached Sulphate	82.00		
S. Semi-Bleached Sulphate	75.00		
N. Unbl. Sulphate	73.00		
S. Unbl. Sulphate	63.50		
Bl. Soda	66.00		
Unbl. Soda	62.00		
Groundwood	46.00		

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

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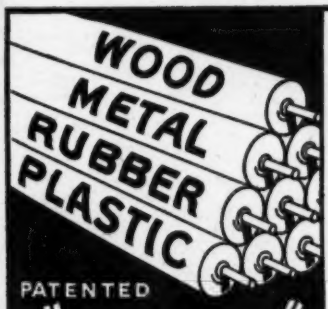

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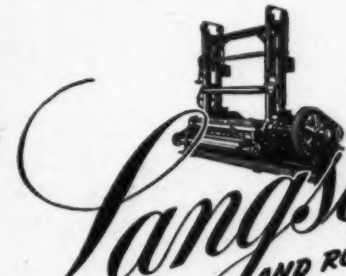

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Old Rags

White, No. 1—		
Repacked	*3.80	—
Miscellaneous	*3.20	—
White, No. 2—		
Repacked	*2.90	—
Miscellaneous	*2.65	—
Third and Blues—		
Repacked	*2.20	—
Miscellaneous	*1.80	—
Roofing Rags—		
No. 1	*1.55	—
No. 2	*1.45	—
No. 3 (bagging)	*1.35	—
No. 4	*1.35	—
No. 5A	*1.35	—
Old Manila Rope	5.75	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25 @	2.40
New Mixed Cuttings	2.00	2.20
New Light Silesias	5.50	5.75
Light Flannelettes	5.50	5.75
New White Cuttings	7.00	7.50
New Light Oxfords	4.00	4.50
New Light Prints	3.00	3.25

Old Rags

No. 1 White Linens	7.50	8.50
No. 2 White Linens	6.50	7.50
No. 3 White Linens	4.50	—
No. 4 White Linens	2.25	3.25
No. 1 White Cotton	4.25	4.75
No. 2 White Cotton	3.25	3.75
No. 3 White Cotton	2.50	3.00
No. 4 White Cotton	1.90	2.20
Extra Light Prints	2.00	2.40
Ord. Light Prints	1.75	2.15
Med. Light Prints	1.55	1.95
Dutch Blue Cottons	2.25	2.50
French Blue Linens	3.00	—
Checks and Blues	2.00	—
Linsey Garments	1.90	2.00
Dark Cottons	1.50	1.60
Old Shopperies	1.30	1.45
New Shopperies	1.45	1.50
French Blues	2.25	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	4.25 @	4.35
Wool Tares, light	4.25	4.50
Wool Tares heavy	4.50	5.00
Bright Bagging	4.50	4.85
Manila Rope—		
Foreign	—	—
Domestic	*5.75	—
Jute Threads	5.50	—
No. 1 Sisal Strings	*4.00	—
Mixed Strings	2.00	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½ @	—
No. 1 Hard White Envelope Cuts	3.12½	—
No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, one cut	2.87½	—
No. 1 Soft White Shavings	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
Mixed Groundwood Colored Shavings	.90	—
Overissue Magazines	1.67½	—
No. 1 Heavy Books & Magazines	1.57½	—
Mixed Books	.85	—
No. 1 White Ledger	2.17½	—
No. 2 Mixed Ledger, colored	1.87½	—
New Manila Envelope Cuttings, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
Extra Manilas	1.85	—
Mixed Kraft, Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	3.25	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	—
New 100% Kraft Corrugated Cuttings	2.25	—
No. 1 Assorted Old Kraft	1.75	—
New Jute Corrugated Cuttings	.90	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.15	—
Box Board Cuttings	.72½	—
White Blank News	1.65	—
Overissue News	.85	—
No. 1 News	.75	—
No. 1 Mixed Paper	.70	—
Old Corrugated Containers	.82½	—
Mill Wrappers	.85	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—		
India	.21 @	—
White Hemp	.21	—
Fine Polished—		
Fine India	.26	—
Unpolished—		
Box	.17¾	—
Paper Makers	.17	—
Tube Rope	.19	—
Wall Paper	.20½	—
Wrapping	.23	—
Soft Fiber Rope	.19	—
Cotton	.25	—

(Hard Fiber)

Medium Java	.18	—
Mex. Sisal	.16	—
Manila	—	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—		
New White No. 1	.07½ @	.07½
New White No. 2	.04½	.05
Light Silesias	.04½	.04¾
Silesias, No. 1	.04	.04¼
Black Silesias, soft	.03¾	.04
New Unbleached	.07¼	.07½
Washable Prints	.03¼	.03½
Washable No. 1	.02	.02¼
Blue Overall	.04½	.05½
Cottons—According to grades—		
Washable shredding	—	.01¾
Fancy Percales	.03¼	.03½
New Black Soft	.02¾	.03
New Dark Seconds	1.75	2.00
Khaki Cuttings—		
No. 1 O. D.	.03	.03¼
No. 2 Mixed	.02¼	.02½
Corduroy	.01¾	.02¼
New Canvas	.04¾	.05¼
New Black Mixed	—	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	—
White No. 2—Repacked	2.90	—
Miscellaneous No. 1	3.20	—
Miscellaneous No. 2	2.65	—
Thirds and Blues—		
Miscellaneous	1.80	—
Repacked	2.20	—
Black Stockings—		
(Export)	Nominal	
Roofing Stock—		
Foreign No. 1	Nominal	
Domestic No. 1	1.55	—
Domestic No. 2	1.45	—
Roofing Bagging	1.35	—
Old Manila Rope	5.75	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—		
Foreign	Nominal	
Domestic	3.00	3.50
Sisal Rope	3.75	—
Mixed	1.00	1.50
Scrap—		
No. 1	3.25	3.50
No. 2	1.75	1.80
Wool Tares, heavy	4.00	4.25
No. 1 New Light Burlap	3.00	4.00
New Burlap Cuttings	3.75	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
Soft White Shavings, one cut	2.50	—
White Blank News	1.65	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
Mixed Groundwood Colored Shavings	.90	—
Overissue Magazines	1.67½	—
No. 1 Heavy Books & Magazines	1.57½	—
Mixed Books	.85	—
No. 1 White Ledger	2.17½	—
No. 2 Mixed Ledger, colored	1.87½	—
No. 1 Heavy Books & Magazines	1.67½	—
Overissue Magazines	1.67½	—
New Manila Envelope Cuttings	2.65	—
No. 1 Assorted Old Kraft	1.75	—
No. 1 Mixed Paper	.70	—
Box Board Cuttings	.72½	—
Kraft Corrugated Cuttings	2.25	—
Old Corrugated Containers	1.15	—
Overissue News	.85	—
No. 1 News	1.00	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½ @	—
No. 1 Hard White Shavings, ruled	2.50	—
Soft White Shavings, Misc.	2.15	—
No. 1 Fly Leaf Shavings	1.67½	—
No. 2 Fly Leaf Shavings	1.12½	—
No. 1 Groundwood Fly Leaf Shavings	1.25	—
No. 2 Groundwood Fly Leaf Shavings	.90	—
Mixed Colored Shavings	.75	—
New Manila Envelope Cuts, one cut	2.87½	—
Hard White Envelope Cuts, one cut	3.37½	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
Kraft Envelope Cuttings	3.25	—
No. 1 Heavy Books & Magazines	1.57	—
New Manila Envelope Cuts, one cut	2.87½	—
New Manila Envelope Cuttings	2.65	—
White Blank News	1.65	—
No. 1 Assorted Old Kraft	1.75	—
No. 1 Mixed Paper	.70	—
Overissue News	.85	—
Box Board Cuttings	.72½	—
New Corrugated Cuttings, Kraft	2.25	—
Old 100% Kraft Corrugated Containers	1.75	—
Old Corrugated Containers	1.15	—
Jute Corrugated Cuttings	1.07½	—

Bagging

(F. o. b. Boston)

Gunny Bagging—		
Foreign	(nominal)	
Domestic	3.75 @	4.00
Sisal Rope No. 1	*4.75	—
Sisal Rope No. 2	*4.25	—
Mixed Rope	1.35	1.50
Transmission Rope—		
Foreign	(nominal)	
Domestic	2.75	3.00
Manila Rope—		
Foreign	(nominal)	
Domestic	5.75	—
Soft Jute Rope	4.50	5.00
Jute Carpet Threads	3.00	3.50
Bleachery Burlap	8.50	9.00
Scrap Burlap—		
Foreign	(nominal)	
Domestic	3.60	3.85
Wool Tares—		
Foreign	(nominal)	
Domestic	4.25	—
Aust. Wool Pouches	4.65	4.87½
New Burlap Cuttings	4.75	5.00
Heavy Baling Bagging	4.00	4.25
Paper Mill Bagging	2.50	3.00
No. 2 Bagging	1.35	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—		
New Light Prints	.04½ @	.04¾
Fancy Percales	.04¼	.05
New White No 1.	.06¾	.07
New Light Flannelettes	.05½	.06
Canton Flannels, Bleached	.06	.06½
Underwear Cutters, Bleached	.06¾	.06¾
Underwear Cutters, Unbleached	.05¾	.06
Silesias No. 1	.06	.06¼
New Black Silesias	.03	.03½
Red Cotton Cuttings	.03½	.04
Soft Unbleached	.06½	.06¾
Blue Cheviots	.05½	.06
Fancy	.02¾	—
Washable	.02¾	—
Khaki Cuttings	.02¾	.03
O. D. Khaki	.03½	.03¾
Corduroy	.03¾	.03½
New Canvas	.06¼	.06¾
B. V. D. Cuttings	.06¾	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—		
Repacked	3.80 @	—*
Miscellaneous	3.20	—*
White No. 2—		
Miscellaneous	2.65	—*
Twos and Blues, Repacked	2.20	—*
Old Blue Overalls	2.25	2.50
Thirds and Blues, Repacked	2.20	—*
Miscellaneous	1.80	—*
Black Stockings	3.50	4.00
Roofing Stock—		
No. 1	1.55	—*
No. 2	1.45	—*
No. 3	1.35	—*
No. 4	1.35	—*
No. 5, Quality A	1.35	—*
Quality B	1.20	—*
Quality C	.95	—*
Old Manila Rope	5.75	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—		
No. 1 Hard White Envelope Cuts, one cut	3.37½	—
No. 1 Hard White Shavings, unruled	2.87½	—
No. 1 Soft White Shavings	2.50	—
No. 1 White Ledger	2.17½	—
No. 1 Heavy Books & Magazines	1.67½	—
White Blank News	1.65	—
Mixed Kraft Env. & Bag Cuttings	2.75	—
No. 1 Assorted Old Kraft	1.75	—
Overissue News	.85	—
No. 1 News	.75	—
No. 1 Mixed Paper	.70	—
No. 1 Roofing Rags	1.55	—
No. 1 Roofing Bags	1.45	—